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1980

FINAL ENVIRONMENTAL STATEMENT

PROPOSED MINING AND RECLAMATION PLAN,

Pearl Mine,

BIG HORN COUNTY, MONTANA

THE GREAT SEAL OF THE STATE OF MONTANA

U.S. DEPARTMENT OF THE INTERIOR
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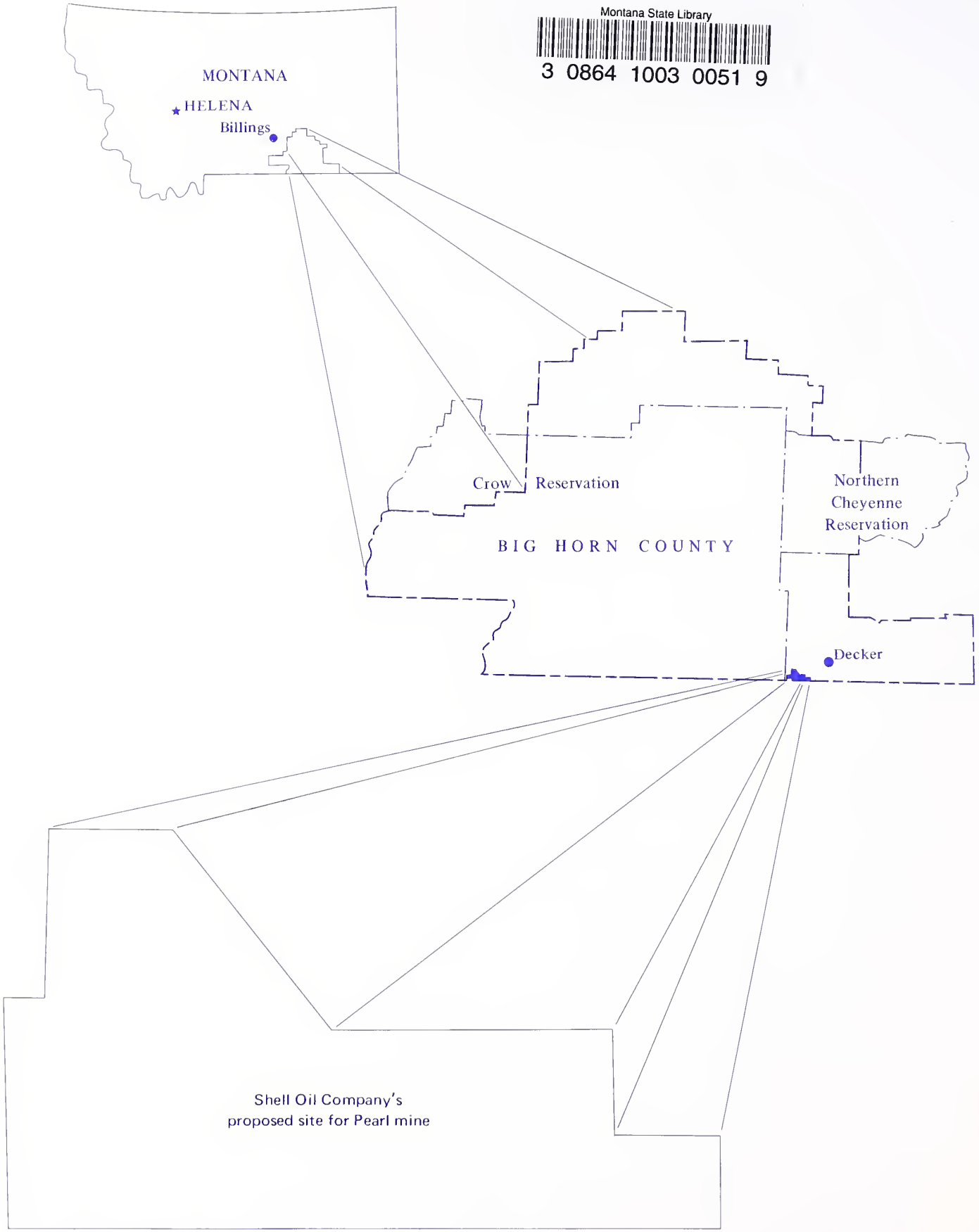

NRIS 427

U.S. DEPARTMENT OF THE INTERIOR
MONTANA DEPARTMENT OF STATE LANDS

FINAL
ENVIRONMENTAL STATEMENT

PROPOSED MINING AND RECLAMATION PLAN, PEARL MINE, BIG HORN COUNTY, MONTANA

Prepared by
U.S. Geological Survey, Department of the Interior
Montana Department of State Lands

Leo Berry, Jr., Commissioner
Montana Department of State Lands

H. William Menard, Director
U.S. Geological Survey

1980

PREFACE

The final environmental statement (FES) on the Pearl mine consists of the following:

- Volume 1, Northern Powder River Basin Coal draft environmental statement;
- Volume 2, Proposed mining and reclamation plan, Pearl mine, Big Horn County, Montana, draft environmental statement;
- Volume 3, Northern Powder River Basin Coal final environmental statement; and
- Volume 4 (this volume), Proposed mining and reclamation plan, Pearl mine, Big Horn County, Montana, final environmental statement.

Volumes 1 and 2 were circulated as drafts for review and comment; a limited number are available on request from the U.S. Geological Survey, Environmental Impact Analysis Program, Box 25046, Mail Stop 701, Denver Federal Center, Denver, Colorado 80225.

This volume considers the proposed Pearl mine: it summarizes revisions to the mine plan made since the DES was issued. It also responds to comments on the DES and identifies changes made in response to the comments.

Comments on volume 1, the Northern Powder River Basin Coal environmental statement, are presented in volume 3 of this FES.

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SUMMARY

PEARL MINE PROPOSAL

( ) Draft (X) Final environment statement

Department of the Interior, U. S. Geological Survey

Montana Department of State Lands

1. Type of action: (X) Administrative ( ) Legislative

2. Brief description of the action:

State and Federal regulatory agencies must decide to permit a mine and reclamation plan, or an alternative to it, for the Pearl mine in Big Horn County, Montana. Shell Oil Company proposes to open a new coal mine, including roads and facilities, and to extend a rail spur from the Decker spur to the Pearl minesite. An estimated 46.5 million tons of low-sulfur coal would be removed from an area of about 616 acres over a period of 27 years.

3. Summary of adverse, unavoidable environmental impacts:

A. Existing soils, vegetation, and wildlife habitat would be disturbed or destroyed incrementally on 1,462 acres over a 27-year period, and their diversity would be lost for possibly several decades or longer following reclamation.

B. Existing local shallow aquifers within the mine pits would be destroyed and replaced with spoils, which when resaturated, would contain water of poor quality; this would probably be unsuitable for domestic or livestock use. If the restoration of the alluvial aquifer were not successful, the reclamation of the riparian vegetation could be adversely affected. This in turn would preclude the reestablishment of premining wildlife populations dependent on this type of habitat.

C. During mining, fugitive dust emissions would increase twofold to eightfold. Emissions would sporadically exceed State and Federal air quality standards. Gaseous emissions would increase but would probably not violate standards. Visibility would be decreased locally during mining.

D. Population in Sheridan County, Wyoming, would increase by approximately 460 persons (including mine employees, ancillary employees, and their families) by 1990 due to the Pearl mine, with a similar increase in traffic (assuming no new town is built). Approximately 49 acres of land would probably be taken out of production for subdivision development. Community services would be further stressed.

E. Sixteen cultural resource sites would be disturbed or destroyed in the 1,462-acre permit area. One of these is eligible for nomination to the National Register of Historic Places; another may be eligible (a determination is now being made).

F. Train traffic on the Decker spur and beyond would increase by about 400 unit trains per year, including empties; this would increase noise, dust, and gaseous air pollution along the right-of-way, and increase the probability of traffic hazards at road crossings.

4. Alternatives considered:

Alternatives available to State and Federal agencies include: (a) no action, approval as proposed; (b) deferring action; (c) preventing further development by suspending operations, cancelling the lease, or acquiring the lease; and (d) rejecting the mine and reclamation plan or restricting development on the lease. Other options include developing selected areas now under lease and approving the proposed mining plan after modification. The mining and reclamation plan must be modified to meet criteria set forth in the Surface Mining Control and Reclamation Act of 1977, and the Montana Strip Reclamation Act of 1973 and other pertinent criteria. Agencies may also add stipulations to permit approval which would minimize the environmental impacts by imposing various technical alternatives. The major stipulations to be considered include: the use of best available control technology for all mine dust and gaseous emissions; implementation of a monitoring system for ambient air; double-lift salvage of topsoil; selective salvage and replacement of soils to better simulate premining conditions; and reduction of slope lengths to minimize erosion.

5. Comments have been requested from: (See Summary Attachment.)

6. The date the draft was made available to the Governor of Montana, Montana EQC, the Federal CEQ, and the public: July 13, 1979

The date the final was made available:

FES 79-

SUMMARY ATTACHMENT

Comments were requested from the following organizations, and were received from those with an asterisk by their name:

Federal agencies:

- Advisory Council on Historic Preservation*
- Federal Energy Regulatory Commission*
- Interstate Commerce Commission
- U.S. Department of Agriculture
  - Forest Service
  - Soil Conservation Service*
- U.S. Department of the Army
  - Corps of Engineers*
- U.S. Department of Commerce
  - Old West Regional Commission
- U.S. Department of Energy
- U.S. Department of Health, Education, and Welfare*
- U.S. Department of Housing and Urban Development*
- U.S. Department of Interior
  - Bureau of Indian Affairs*
  - Bureau of Mines*
  - Bureau of Reclamation*
  - Fish and Wildlife Service*
  - Heritage Conservation and Recreation Service*
  - National Park Service
  - Office of Surface Mining*
- U.S. Department of Labor
  - Mining Safety and Health Administration*
- U.S. Department of Transportation
- U.S. Environmental Protection Agency*

State and local agencies:

- Office of the Governor, Montana
- Office of the Governor, Wyoming*
- Montana Agricultural Experiment Station
- Montana Bureau of Mines and Geology
- Montana Department of Community Affairs
- Montana Department of Fish and Game*
- Montana Department of Health and Environmental Sciences
- Montana Department of Natural Resources and Conservation
- Montana Department of Revenue
- Montana Energy Advisory Council
- Montana Environmental Quality Council
- Montana Historical Society*
- Board of County Commissioners, Big Horn County, Montana
- Board of County Commissioners, Rosebud County, Montana
- Board of County Commissioners, Sheridan County, Wyoming
- Mayor, City of Sheridan

Tribal councils:

Northern Cheyenne
Crow

Applicant:

Shell Oil Company*

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(Incorporated by reference)

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CHAPTER I

DESCRIPTION OF THE PROPOSAL UNDER CONSIDERATION

A. INTRODUCTION

This FES is a joint State-Federal effort based on Shell Oil Company's permit applications, and is a supplemental volume to the Northern Powder River Basin Coal regional environmental statement. Volume two describes in detail the specific mine and reclamation plan for the proposed Pearl mine in southern Big Horn County, Montana.

To summarize, Shell proposed a truck and shovel operation producing 2 million tons per year, and having a 24-year mine life. Reclamation would continue through year 27. The permit area would cover 1,462 acres and mining would draw approximately 460 people into the region. (This includes families and ancillary employment.)

B. REVISIONS

Substantive changes have not been made in the proposed Pearl mine plan. Those changes made bring the mine plan closer to complete compliance with the final regulatory program under the Surface Mining Control and Reclamation Act of 1977 and Montana's Strip and Underground Mine Reclamation Act of 1973.

The following improvements have been made in the mine and reclamation plan:

- Innoculation of legume seed with bacteria.
- Drilling on slopes of 3:1 or less in lieu of partial broadcasting.
- Hand collecting of native seed.
- Selective salvage of soils and overburden materials having the potential to be toxic or to otherwise cause problems.

Shell proposes to divert Little Youngs Creek around the southwest corner of the south pit, as shown in figure I-1. Little Youngs Creek, at this point, drains a 13.3 $mile^2$ area. Estimated peak flows, in cubic feet per second (cfs), follow:[1]

2-year---------	37 cfs	25-year---------	274 cfs
5-year---------	102 cfs	50-year---------	376 cfs
10-year---------	168 cfs	100-year---------	496 cfs

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[1]These figures are from volume III of the company's application, and were computed using Johnson and Omang, 1976, USGS Open-File Report 75-650.

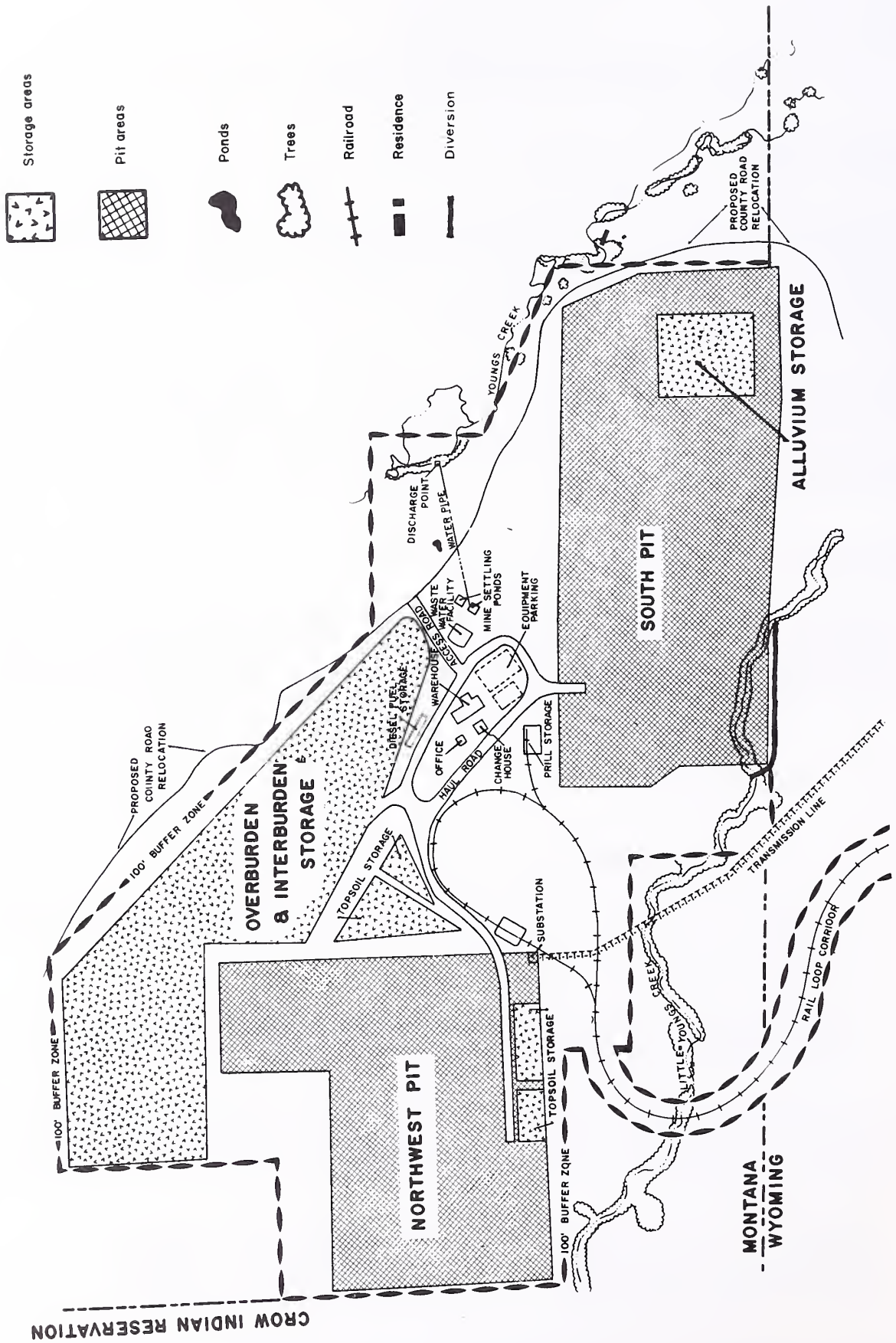


Figure I-1.–Facilities location for Pearl mine.

The existing creek channel has an average 7-foot bottom width and 1:1.25 slopes. The diversion channel is designed to have a bottom width of 8 feet and variable slopes. In sandstone, siltstone, and shale materials, slopes would be 1:1; in fractured, weathered, or friable rock, slopes would be 1:1.5; and in alluvial material and/or channel fill, slopes would be 1:1.25. The diversion would be about 2,000 feet long.

To compute expected velocities, the company used an n value of 0.04, which is high when considering the materials encountered in the construction of the diversion. Values of 0.03 to 0.035 would probably be more accurate. (King, Handbook of Hydraulics, p. 7-20). The velocities computed for discharge values of 370 and 740 cfs would probably cause erosion in reaches of the diversion that would be constructed in fractured, weathered, and friable rocks, and in alluvial material.

Following mining, Little Youngs Creek would be returned to its approximate original contours.

SMCRA rules and regulations do not preclude mining through alluvial valley floors. Rather, SMCRA requires the preservation of hydrologic functions; the company believes it can meet this requirement. The company currently proposes to mine through Little Youngs Creek whether or not it meets the OSM criteria for an alluvial valley floor.[2]

Based on data collected during 1979, inflow into the south pit was estimated in gallons per minute (gpm) as follows:[3]

Source	Flow (gpm)
Alluvium:[4]	
Storage	180
Mined block	73
M coal seam	0
G coal seam	0
Clinker	0
Total	253

[2]Shell Oil Company, August 23, 1979, Testimony at public hearings for DES 79-41, Sheridan Wyoming.

[3]WESTECH, Inc., 1979, Groundwater inflow into the south pit: Report to Shell Oil Company.

[4]Intercepted water from the alluvium is expected to flow at a rate of 71 gpm. The company plans to use perimeter dewatering procedures to intercept this flow before it enters the pit.

This is only slightly above the inflow at the Ash Creek mine, which was used for purposes of estimation in the draft analysis. Therefore, the impact would probably not differ significantly from that projected on pages III-7 and III-8 of the Pearl draft. The company does not expect any inflow from the interbedded sandstones. Data indicate that these strata have limited horizontal continuity. Strata overlying the G coal seam, generally capable of acting as aquifers, appear to be unsaturated in the permit area.

CHAPTER IX

CONSULTATION AND COORDINATION

A. ORGANIZATION OF STATE AND FEDERAL INTERAGENCY TASK FORCE FOR THIS ENVIRONMENTAL STATEMENT

Instructions to prepare regional and site-specific environmental statements for the northern Powder River coal basin were issued to the Geological Survey and the Bureau of Land Management by the Secretary of the Interior on April 29, 1976. The Geological Survey was designated as lead agency. Because of some duplicate or closely related actions pending before State and Federal agencies, and because the National and the Montana environmental policy acts have similar requirements, the State of Montana joined with the Federal task force in August 1976 to prepare these environmental statements.

B. DEVELOPMENT OF THIS STATEMENT

Public notice was given in June 1977 that an environmental impact statement was to be prepared on the proposed Pearl mining and reclamation plan by a joint State-Federal task force. The State task force personnel were under the administrative supervision of a State coordinator attached to the office of the Commissioner of the Montana Department of State Lands.

In preparation of this draft statement, data and/or review comments were solicited from a wide range of State and Federal agencies, county and city officials, consultants, and private interest groups.

A close working relationship was established with State and local agencies in Montana. All divisions of Montana State government having jurisdictional interests in the projects have been contacted and many have supplied data.

During the preparation of this environmental impact statement, consultation and coordination was made with the following organizations:

Government:

Federal:

Advisory Council on Historic Preservation
U.S. Department of Agriculture:
  Forest Service
  Soil Conservation Service
U.S. Department of Commerce:
  Old West Regional Commission
U.S. Department of the Interior:
  Bureau of Indian Affairs

Bureau of Land Management
Bureau of Mines
Bureau of Reclamation
Fish and Wildlife Service
Heritage Conservation and Recreation Service
National Park Service
Office of Surface Mining
U.S. Department of Labor:
Mine Safety and Health Administration
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Interstate Commerce Commission

State of Montana:

Office of the Governor
Agricultural and Experiment Station
Bureau of Mines and Geology
Department of Community Affairs
Department of Fish and Game
Department of Health and Environmental Sciences
Department of Revenue
Montana Historical Society:
State Historic Preservation Office

State of Wyoming:

Office of the Governor
Board of County Commissioners, Sheridan County, Wyoming
Mayor, City of Sheridan
Sheridan County Planning Commission

Local:

Big Horn County Planning Director
Board of Commissioners, Big Horn County, Montana

Non-government:

Meadowlark Group
Montana State University
Shell Oil Company
University of Montana
WESTECH, Inc.

The Shell Oil Company provided data and information on its proposed activities, and greatly facilitated field observations and data collection by task force members.

The Division of Archeology and Cultural Resources, Mineral Research Center, Montana College of Mineral Science and Technology Alumni Foundation,

Butte, Montana, provided the archeological reconnaisance of the Pearl area to supplement the data provided by the Montana Departments of Natural Resources and Conservation, Highways, Health and Environmental Sciences, and Fish and Game; by Montana State University, Department of Agricultural Economics; and by the University of Montana, Department of Environmental Studies.

C. REVIEW OF THIS STATEMENT

In accordance with guidelines of the Council on Environmental Quality and the Montana Department of State Lands, copies of the draft statement were made available to the public for comments and suggestions. Comments were also solicited from the above-mentioned agencies and organizations.

This environmental statement is available for public review at the following places:

- U.S. Geological Survey Public Inquiries Office, Room 1012, Federal Building, 1961 Stout Street, Denver, CO 80202.
- U.S. Geological Survey Library, 1526 Cole Blvd., Golden, CO 80401.
- U.S. Geological Survey Library, Room 4A100, USGS National Center, 12201 Sunrise Valley Drive, Reston, VA 22092.
- Montana Department of State Lands, 1625 11th Ave., Helena, MT 59601.
- Bureau of Land Management (West of Miles City), P. O. Box 940, Miles City, MT 59301.
- Parmley Billings Public Library, 510 North Broadway, Billings, MT 59103.
- Sheridan County Fulmer Public Library, 320 North Brooks, Sheridan, WY 82801.
- Big Horn County Public Library, 419 North Custer Ave., Hardin, MT 59034.
- The Rosebud County Library, 201 North 9th Ave., Forsyth, MT 59327.

A limited number of copies are available on request from the United States Geological Survey, Land Information and Analysis Office, Box 25046, Mail Stop 701, Federal Center, Lakewood, CO 80225; and the Montana Department of State Lands, 1625 11th Ave., Helena, MT 59601.

Comments on the draft environmental statement were sought from industry, officials from all levels of government, environmental groups, and concerned citizens. Written comments were received from those agencies identified in the Summary Attachment, page vii.

D. COMMENTS AND RESPONSES

Letters received during the comment period, along with the task force responses, are printed on the following pages.

Advisory Council On Historic Preservation

1522 K Street NW.
Washington D.C.
20005

September 24, 1979

Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

This is in response to your request of July 13, 1979, for comments on the draft environmental statement (DES) for the Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana.

The Council has reviewed the DES and notes that the U.S. Geological Survey has determined that the proposed undertaking will not effect properties included in or eligible for inclusion in the National Register of Historic Places. Accordingly, the Council has no further comment to make at this time. It is suggested, however, that the final environmental statement contain the Montana State Historic Preservation Officer's concurrence in the U.S. Geological Survey's determination of no effect.

Should you have any questions or require additional information regarding this matter, please contact Brit Allan Storey of the Council staff at P. O. Box 25085, Denver, Colorado 80225, or at (303) 234-4946, an FTS number.

Sincerely,

Louis S. Wall
Chief, Western Division
of Project Review

Thank you for your comments. See letter 18.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

August 12, 1979

Director, U.S. Geological Survey
108 National Center
Reston, VA 22092

Dear Sir:

I am replying to your request to the Federal Energy Regulatory Commission for comments on the Draft Environmental Impact Statement for the Mining and Reclamation Plan, Pearl Mine, Montana. This Draft EIS has been reviewed by appropriate FERC staff components upon whose evaluation this response is based.

The staff concentrates its review of other agencies' environmental impact statements basically on those areas of the electric power, natural gas, and oil pipeline industries for which the Commission has jurisdiction by law, or where staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in these areas of concern nor serious conflicts with this agency's responsibilities should this action be undertaken.

Thank you for the opportunity to review this statement.

Sincerely,

Jack M. Heinemann
Advisor on Environmental Quality

Thank you for your comments.

FEDERAL ENERGY REGULATORY COMMISSION
CHICAGO REGIONAL OFFICE
230 SOUTH DEARBORN STREET, ROOM 3130
CHICAGO, ILLINOIS 60604

September 26, 1979

Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

We have reviewed the Draft Environmental Statement titled, "Northern Powder River Basin Coal, Montana," covering the opening of a new coal mine and associated facilities.

Comments of this office are made in accordance with the National Environmental Policy Act of 1969 and the August 1, 1973 Guidelines of the Council on Environmental Quality. Our principal concern with developments affecting land and water resources is their possible effect on developed and undeveloped hydroelectric resources and natural gas pipeline facilities.

Because the above-noted proposed development would not pose a major obstacle to the construction or operation of such facilities and because the Draft does not indicate that existing natural gas or hydroelectric developments would be adversely affected, we have no specific comments.

These comments are of this office and therefore do not necessarily represent the views of the Federal Energy Regulatory Commission.

Thank you for the opportunity to comment on this Draft Environmental Statement.

Sincerely,

Lawrence F. Coffill

Lawrence F. Coffill
Regional Engineer

Thank you for your comments.

United States Department of Agriculture
Soil Conservation Service
P.O. Box 970
Bozeman, Montana
59715

September 10, 1979

Mr. J. R. Balsley, Director
U. S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

Dear Mr. Balsley:

We acknowledge receipt of the draft environmental statement for Northern Powder River Basin Coal, Montana, and Pearl Mine, Big Horn County, Montana, that was received by Van K Haderlie, State Conservationist, Bozeman, Montana, Soil Conservation Service, on July 20, 1979, for review and comment.

We have reviewed the above draft environmental statement and find that there are no controversial items in the statement within the realm of the Soil Conservation Service's expertise and responsibilities. We find no conflict with any SCS on-going or planned programs or projects.

We appreciate the opportunity to review and comment on this proposed project.

Thank you for your comments.

Sincerely,

Van K Haderlie
State Conservationist

cc: Director, Office of Federal Activities (Mail Code A-104)
Environmental Protection Agency
Room 537, West Tower
401 M Street, S.W.
Washington, D.C. 20460

Kenneth L Williams, Director, TSC, SCS, Portland, Oregon
Norman A. Berg, Administrator, SCS, Washington, D.C.

DEPARTMENT OF THE ARMY
OMAHA DISTRICT CORPS OF ENGINEERS
6014 U.S POST OFFICE AND COURTHOUSE
OMAHA NEBRASKA 68102

MROPD-A

13 September 1979

The Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

Dear Sir:

1 We have reviewed your Draft Environmental Statements on the Northern Powder River Basin Coal, Montana, and the Proposed Mining and Reclamation Plan-Pearl Mine, Montana.

Our comments on the two documents have been divided into five categories:

a. Pursuant to Section 404 of the Clean Water Act
b. Flood Plain Management
c. Engineering
d. Environmental
e. Cultural Resources

Our comments are appended to this letter.

It may be that the activity, as proposed, may require state water quality certification. This can be determined by contacting the Montana Department of Health and Environmental Sciences, Water Quality Bureau, Capitol Station, Helena, Montana 59601.

If you have any questions concerning our comments, please call this office.

Thank you for the opportunity of reviewing these documents.

Sincerely,

John E. Velehradsky

JOHN E. VELEHRADSKY
Chief, Planning Division

1 Incl
Comments

1 Thank you for your comments. Water quality permits are required and the Montana Department of Health and Environmental Sciences is being contacted. The following responses (2-13) refer only to the Pearl mine; for regional responses see volume 3.

OMAHA DISTRICT'S COMMENTS ON DRAFT ENVIRONMENTAL STATEMENTS FOR THE PROPOSED MINING AND RECLAMATION PLAN - PEARL MINE, MONTANA AND THE NORTHERN POWDER RIVER BASIN COAL - MONTANA

PURSUANT TO SECTION 404 OF THE CLEAN WATER ACT

The comments contained in this section are addressed to both statements.

1. The secondary tributaries of the Yellowstone River including tributaries of Armells and Rosebud Creeks, Youngs & Little Youngs Creeks and Spring Creek, based on the information in this office, have an average annual flow of less than 5 cubic feet per second. Accordingly, the activities for the purposes of Section 404 of the Clean Water Act are authorized under the nationwide permit without further processing provided the following conditions are complied with:

2 a. That the fill material will not destroy a threatened or endangered species as identified under the Endangered Species Act or endanger the critical habitat of such species.

3 b. That the fill will consist of suitable material free from toxic pollutants in other than trace quantities.

4 c. That the fill created by the discharge will be properly maintained to prevent erosion and/or other non-point sources of pollution.

5 d. That the fill will not occur in a component of the National Wild and Scenic Rivers System nor in a component of a State Wild and Scenic Rivers System.

2. In addition to the conditions specified above, the following management practices should be followed to the maximum extent practicable in the performance of the work:

6 a. Fills in spawning areas during spawning seasons should be avoided.

7 b. If the fill creates an impoundment of water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flows, should be minimized.

8 c. Fills in wetlands areas should be avoided.

9 d. Heavy equipment working in wetlands should be placed on mats.

10 e. Fills into breeding and nesting areas for migratory waterfowl should be avoided.

11 f. All temporary fills should be removed in their entirety.

2 No threatened or endangered species would be destroyed by fill.

3 The only "fill" would consist of toxic-free, native alluvial materials removed from the creek bottom of Little Youngs Creek and then replaced.

4 The fill would be properly maintained.

5 There are no components of either the State or National Wild and Scenic River System in the permit area.

6 There are no spawning areas on the Pearl area.

7 No impoundments or accelerated flow would be created by fill.

8 There are no wetlands in this area.

9 See previous response.

10 No fill would be placed in breeding and nesting areas for migratory waterfowl.

11 All temporary fills would be removed.

12 3. In the event other waters of the United States or wetlands are to be impacted, the Corps of Engineers, Omaha District should be notified so that their status pursuant to Section 404 may be determined.

FLOOD PLAIN MANAGEMENT

The comments contained in this section are addressed to both statements.

13 1. We have reviewed the two DES's for these projects relative to floodplain management. We are concerned that a provision is not included somewhere that any activity which will alter a floodplain be executed so that the elevation of the 100-year flood will not be increased by more than one foot relative to pre-activity conditions. This should reduce both the potential for increased flooding upstream from the construction activity due to backwater effects as well as downstream due to the failure of embankments which were impounding floodwaters. Also, if channel modifications are undertaken, the new channel should have, as a minimum, the same capacity as the existing channel.

ENGINEERING

The comments contained hereafter are addressed to each Draft Statement individually.

A. Proposed Mining and Reclamation Plan - Pearl, Mine, Montana.

14 (1) Chapter I - Page I-16 Item 8. Will the settling ponds accommodate the intense rainstorms and snowmelt referred to on Page II-6 Item B.a.?

15 (2) Chapter I - Page I-16 Item G. What type of program will be implemented to insure the long term success of the reclamation program? A 2-year reclamation program following completion of the mining activity does not appear sufficient to insure total recovery of native grasses.

16 (3) Chapter II - Page II-12 Item c. Very limited trace metal data appears to have been available. Will the mining activity result in increased trace metal concentrations in nearby streams?

17 (4) Chapter II - Page II-9 Item b. Since the mining area is subject to rapid snowmelt and intense rainstorms, the sediment referred to in this section may reach the Tongue River in a relatively short time depending upon flow magnitude.

12 Comment noted.

13 Reclaimed channels would have the same capacity as the existing channel.

14 State and Federal regulations require that the settling ponds handle only runoff from within the mine area; they need not handle discharge from outside. The ponds must be designed to contain the runoff from a 10-year, 24-hour storm, as required by State and Federal regulations.

15 Reclamation would continue throughout the life of the mine. As per SMCRA, the mining company would be responsible for reclamation for a minimum of 10 years.

16 Solubility of trace metals at the high pH levels present in the soil and overburden is low; consequently impacts are expected to be minimal.

17 Any sediment from the mine area would be contained in settling ponds (shown in figure I-8 of volume 2 and figure I-1 in this volume).

18 (5) Chapter VII. A table, using some standard energy unit, would be useful in determining the net energy production of this mining operation.

19 (6) Chapter VIII. It appears that no alternatives such as on-site coal gasification, electrical generation, or other substitutes, were studied. Since this mining operation would utilize large quantities of gasoline and diesel fuel, both for mining and transport of coal, some other alternatives could result in a higher net energy production.

20 (7) The potential for acid mine drainage is not adequately addressed. In paragraph B.1. of Chapter III, it was stated that water pumped from the mine pits would be discharged into Youngs Creek, no mention was made of acid water content. Ramifications, and if necessary, mitigation should be discussed.

21 B. Northern Powder River Basin Coal, Montana.

(1) Chapter II - Page II-13 Item B.1. Water quality data from a single sampling date is of very limited use and can be misleading in determining stream water quality. Yearly or seasonal averages established over a period of several years would provide a more accurate picture of existing water quality.

(2) Chapter IV. Would the settling ponds accommodate the intense rainstorms and snowmelt which occur in the project area?

(3) Chapter IV. Little mention is made of trace metals, such as mercury, which can be high in some areas of Montana. Will mining activities, such as opening of bentonite seams, increase existing levels?

(4) Chapter IV. Some of the project area streams may be impacted; however, little mention is made of existing stream biota.

(5) Chapter VIII. It was repeatedly stated in this DES that water quality impacts will be negligible. However, the hypothetical mine model along the Tongue River indicated significant water quality impacts. The differences between the hypothetical model and the proposed mining operation are not clear. These should be discussed and results clearly stated.

(6) The potential for acid mine drainage does not appear to be addressed, nor was the potential for increased soil erosion during the construction of haul roads.

ENVIRONMENTAL

22 A. Proposed Mining & Reclamation Plan-Pearl Mine, Montana.

(1) Chapter III. Little mention is made of the aquatic life presently existing in Youngs Creek. The statement that detrimental effects will not occur should be substantiated.

18 Comment noted.

19 This EIS evaluates a proposal to mine coal for export to out-of-state markets. An analysis of any other use would be speculative. Onsite use is not a viable alternative now, but could be considered at a later date. Although this coal may not be available at that time, ample, comparable reserves remain in the area.

20 Acid mine drainage should not present a problem in the region because of the calcareous nature of the overburden and the low sulfur content of the coal.

21 These questions are addressed in the regional, volume 3, chapter IX, letter 2.

22 Little mention is made of the aquatic life in Youngs Creek because little impact is expected, and because the quality and quantity of water discharged into Youngs Creek would be controlled through State and Federal regulations.

23 (2) General Comments. Some of the project area streams may be impacted in terms of existing fisheries, yet no species list for fish is contained in the DES.

24 (3) After the addition of pit water from the Pearl Mine to Youngs Creek the waters may be similar in their Ca, Mg, and Na content to the Youngs Creek waters below Ash Creek mine. The sodium adsorption ratio of these waters range from 3.5 and 29. Waters with ratios over 20 could cause problems for irrigators which is contrary to the statement on page III-6 of Pearl Mine DES. Discussion is warranted.

25 (4) More detailed information should be available on the diversion of Little Youngs Creek.

26 B. DES Northern Powder River Basin Coal, Montana.

(1) Chapter II. Some of the project area streams may be impacted in terms of existing fisheries and other stream biota, yet no species list for fish is contained in the DES.

(2) Chapter IV. What effect would increased sediment load due to mining operations have on existing stream biota?

CULTURAL RESOURCES

A. Proposed Mining and Reclamation Plan - Pearl Mine, Montana.

27 (1) Chapter II - Page II-44. The document indicates that archeological site locations are on file with state and federal offices and may be viewed. Under no circumstances should specific site locations be made available to the public. Availability of such information only increases vandalism of and damage to sites by amateur collectors and commercial antiquities dealers. In both cases this results in a permanent loss of information to professional archeologists and ultimately, the public. It is not necessary to provide this information to the public under the Freedom of Information Act. Specific site locations are regularly withheld from the public in most states.

28 (2) Chapter III. Guidelines for the protection of deeply buried archeological sites which cannot be identified by surface survey need to be made. It is not necessary that these resources be lost because they were not identified before mining as stated on Page VII-1, para. 9. This is routinely required in other earth-moving activities on Federal lands.

29 B. Northern Powder River Basin Coal, Montana.

Discounting the existence of Cultural Resources on private land is illegal. The following are an Executive Order and Public Laws which refer to Cultural Resources found on private land.

23 There are no fisheries in the project area (see volume 2, page II-40). The fishery in Youngs Creek--to the east of the project area--is limited (see table below).

Fisheries in the Pearl mine vicinity

Brook trout*---------	Salvelinus fontinalis
Fathead minnows------	Pimephales promelas
Green sunfish*-------	Lepomis cyanellus
Longnose dace--------	Rhinichthys cataractae
White suckers--------	Catastomus commersoni

*These fish were found only in the upper reaches of Youngs Creek, where the creek is still a cold-water stream. (Youngs Creek changes to a warm, silted stream in the vicinity of the Pearl area.) The remaining species of fish are found in both Youngs Creek and Little Youngs Creek.

24 No regulations control the SAR of discharged waters. The SAR could cause problems if large quantities of water from the coal seams are discharged. However, the maximum discharge from the coal is expected to be less than 75 gallons per minute. Most of the pit water would be from alluvium and would have a low SAR. When the water from coal and alluvial aquifers are mixed, the resulting SAR cannot be accurately predicted. If SAR appeared to be a problem, the regulatory agencies could require monitoring of the water, and subsequent mitigatory measures.

25 Comment noted; see chapter I of this volume.

26 Responses to these comments are provided in the regional, volume 3, chapter IX, letter 2.

27 Comments noted. Actual site locations would not be released.

28 Comment noted. Page VIII-1: change "before" to during.

29 Responses to these comments are provided in the regional volume 3, chapter IX, letter 2.

29 Executive Order 11593

"Section 1... Agencies of the executive branch of Government... shall... (3), in consultation with the Advisory Council on Historic Preservation... institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural or archeological significance...."

Public Law 86-523

"SEC. 3. (a) Whenever any Federal agency finds, or is notified, in writing, by an appropriate historical or archeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, such agency shall notify the Secretary, in writing, and shall provide the Secretary with appropriate information concerning the project, program, or activity...."

"SEC. 4. (a) The Secretary, upon notification, in writing, by any Federal or State agency or appropriate historical or archeological authority that scientific, prehistorical, historical, or archeological data is being or may be irrevocably lost or destroyed by any Federal... assisted or licensed project, activity, or program, shall, if he determines that such data is significiant and is being or may be irrevocably lost or destroyed and after reasonable notice to the agency responsible for funding or licensing such project, activity, or program, conduct or cause to be conducted a survey and other investigation of the areas which are or may be affected and recover and preserve such data (including analysis and publication) which, in his opinion, are not being, but should be, recovered and preserved in the public interest."

Public Law 89-665

"SEC. 106. The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under title II of this Act a reasonable opportunity to comment with regard to such undertaking."

29 The operation of a coal strip mine on public or private lands requires the issuance of federal licenses and permits, and federal inspection to remain in operation, all of which constitute federal actions as referenced in the above legislation. Hence, cultural resources must be addressed, even on private lands. Any federal action undertaken without addressing impacts on cultural resources places the agency responsible in violation of federal law.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

August 31, 1979

Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

We have reviewed the Draft Environmental Statement (ES) on the Northern Powder River Basin Coal, Montana, and the Draft Environmental Statement on Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana. We are responding on behalf of the Public Health Service.

In reviewing the regional analysis for the above project which involves all of the mining and reclamation plans for the Basin, we offer the following comments:

1 Health and Safety

A brief discussion should be presented in the ES about the occupational hazards associated with mine development and operation. The overall health and safety program that will be implemented to reduce occupational health problems and potential hazards should also be mentioned. In addition, it should be explained if local health services can accommodate the expected number of accidents and injuries related to the proposed action.

2 Air Quality

According to the ES, the air quality impacts of the proposed actions would be significant. We understand that the National Ambient Air Quality Standards (NAAQS) for total suspended particulates ". . . would frequently be exceeded near all three mine sites during mine life."

Since the Big Sky Mine is in a "nonattainment area," and is a major stationary source, we note that construction or modification is not permitted by the State if emissions from the sources would cause violation of NAAQS unless the total suspended particulates (TSP) are offset by an emissions decrease elsewhere. The ES should clarify if the offset can and will be permitted and whether the other two mines and the Colstrip units will require offsets as well.

1-5 See these responses in the regional, volume 3.

Page 2 - Director

3 The ES reveals that the U.S. Environmental Protection Agency has tentatively determined that the new scrubbing process on the additional Colstrip units 3 and 4 will meet the required "best available control technology" and the prevention of significant deterioration (PSD) requirements for sulfur dioxide. It should be clarified whether the emissions under the new pollution controls would in fact meet the revised NAAQS.

4 We believe this document should address the possible long-term health effects upon workers and local residents from the predicted emission concentrations that are associated with the additional Colstrip units, its coal handling facilities, and the mine sites.

Secondary Effects

5 While the proposed project provides a general description of the capability of the existing infrastructure (page II-109-110), it fails to address the project's potential impacts upon this infrastructure, i.e., housing, water, sewer, and solid waste services. It is important that mine development be controlled such that it is in a time frame consistent with infrastructure improvements. Special land use and development controls must be carefully considered in the mining permit process in order to prevent the overloading of infrastructure facilities and interim or long-term violation of State and Federal environmental regulations.

The following comments are specific to the proposed mining and reclamation plans for the Pearl Mine:

Air Quality

6 According to the ES, 6,000 tons of particulate emissions would be added to the air each year for 24 years. This represents a significant air quality impact unless it can be satisfactorily reduced. Even with the use of best available control technology (BACT) for dust abatement, air quality in the vicinity of the mine will not meet NAAQS unless emission controls are also implemented at the adjacent Ash Creek Mine. The ES should indicate whether the Ash Creek Mine will be required to use BACT to reduce its emissions so that the combination of emissions from both Ash Creek and the proposed Pearl Mine will meet NAAQS.

7 We note that the majority of the emissions, approximately 82 percent, or 4,920 tons/year, result from haul roads and coal handling facilities. While BACT will be used in controlling fugitive dust on haul roads, its effectiveness in controlling fugitive dust caused by natural winds and mine vehicles using temporary dirt roads (less than 2 months) and the overburden storage area, should be noted as well.

6 Emissions from the Ash Creek mine must meet Wyoming State and Federal standards. The combined controlled emissions from Pearl and Ash Creek would probably sporadically violate standards for fugitive dust. Some combination of fugitive dust controls for both mines may be required in order to meet ambient air quality standards.

7 Comment noted.

8 Another significant source is coal dust loss, 8,000 tons per year, due to the transport of open coal train cars. It should be indicated whether the described binding agent controls during coal loading operations would in fact be required as part of BACT.

8 The company and EPA have not yet defined BACT, therefore this statement cannot be made.

Water Supply

9 It appears that some wells in the project areas are dependent upon local aquifers for recharge. In fact, the ES indicates that a nearby ranch house may be deprived of its present water supply because of mining operations. The ES should specify the number of wells providing potable water and the population using wells in the area that could ultimately be impacted by this project or future expansion. We believe measures to adequately mitigate any loss of potable water to local livestock wells, homes, etc. should be incorporated into the project.

9 The ranchhouse mentioned is the "population" that uses wells in the the area. The company must mitigate any loss of potable or stock water caused by mining.

Water Quality

10 Interim and permanent revegetation of disturbed soils is important in order to reduce erosion and potential water quality degradation in the project area. We understand that the overburden material contains numerous strata that exceed the State suspect level guidelines for determining overburden suitability for revegetation. Apparently ". . .overburden spoils located at and near the regraded surface. . ." will be negatively influenced by the clay percentage, the materials' high electrical conductivity, a high sodium-adsorption-ratio, and excessive nickel, molybdenum, cadmium, and nitrate concentrations. It appears that the Shell Oil Company has chosen to rely on mixing of the overburden materials, rather than selective salvage, to reduce the spoils' toxic concentrations. We note that this technique will probably not eliminate problems. Therefore, the significance of the above factors in negating interim revegetation of the overburden storage area and long-term revegetation of the reclaimed area with topsoil additions should be discussed.

10 The company has since changed its mine plan and would selectively handle potentially toxic or undesirable materials.

11 The potential effects of leachate or surface runoff from the overburden storage area and other exposed areas of the mine upon local wells or water systems should also be addressed. The adequacy of retention basins and chemical treatment measures to retain adverse nutrient and heavy metal concentrations in settling ponds should also be discussed.

11 All leachate and runoff from exposed areas of the mine would be collected and directed to detention ponds; prior to release, the quality would meet Department of Health and Environmental Sciences standards. Little or no heavy metals would be found in this water. See letter 5, response 16 and letter 9, response 4.

Secondary Effects

12 It is noted in the ES that long-term impacts from this proposal could be significant because the applicant will probably apply for

12 Comment noted. See volume 1, page II-10, figure II-4.

Page 4 - Director

leases of the adjacent coal. The extent of the commerical coal reserves in the area, particularly those adjacent to the project area, should be explained to provide the public with a better idea of the predicted future expansion.

13 The effects of the project upon community services such as water supply, housing, solid waste, and sewage treatment have not been satisfactorily addressed. Both the short- and long-term effects upon the infrastructure of local communities should be discussed.

Thank you for the opportunity of reviewing these documents. We would appreciate receiving two copies of the final environmental statement when it is available.

Sincerely yours,

for Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Bureau of State Services

13 Comment noted. See volume 1, pages IV-56 through IV-60.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGION VIII
FEDERAL OFFICE BUILDING
19TH AND STOUT STREETS
DENVER COLORADO 80294

August 8, 1979

OFFICE OF THE
PRINCIPAL REGIONAL OFFICIAL

ROFEC

Mr. H. William Menard
Director
U. S. Geological Survey
Reston, Va. 22092

Dear Mr. Menard:

This will acknowledge receipt of your draft Environmental Impact Statement for the Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana.

We have reviewed the report and believe you have adequately addressed the impacts expected to result when the proposed plan of development is undertaken. We have no comments at this time.

Sincerely yours,

Thomas E. Moore
Director, ROFEC
Regional Environmental Officer

Thank you for your comments.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

REGION VIII

August 27, 1979

IN REPLY REFER TO:
8SOQ

Mr. H. William Menard
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Mr. Menard:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (EIS), for the proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana.

Your Draft EIS has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD) for review of other agencies' EIS's. These areas focus on a proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas. Within this context, we feel that this document is adequate.

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Office Environmental Clearance Officer, at FTS 327-3102 in Denver.

Sincerely,

Raymond D. McKinney
Director
Program Planning and Evaluation

Thank you for your comments.

AREA OFFICE
Denver, Colorado

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
BILLINGS AREA OFFICE
316 North 26th St.
BILLINGS, MONTANA 59101

IN REPLY REFER TO:
Environmental
Quality

SEP 1 1 1979

Memorandum

To: Director, U.S. Geological Survey
Reston, Virginia

From: Office of the Area Director

Subject: Review of Draft Environmental Statement, Development of Coal Resources in Southeastern Montana (DES 79/41)

This office has, as requested, reviewed the subject environmental statements. Our comments are limited to those areas wherein we have jurisdiction and or special expertise.

Northern Powder River Basin Coal, Montana

1 1. Page II-13, Hydrology. This section in part discusses the appropriated and unused discharge of the Tongue River and other streams. We believe it would be appropriate that inasmuch as water quantity and quality of the streams in the vicinity of the mining will likely be reduced, that Indian water rights be discussed. It should be recognized that lands within a reservation hold a reserved right to use the waters which are adjacent to originate on and/or flow through the reservation. This reserved right is to guarantee waters sufficient in quantity and quality to fulfill the present and anticipated needs of the Tribes. Certainly any reduction in flow or water quality would be in contradiction to these rights.

It must also be recognized that at the present time there is litigation under way in Wyoming and Montana which involves the adjudication of the Tongue River. The United States is a defendant in this suit on behalf of the Northern Cheyenne Tribe.

2 2. Page II-43 discusses emissions from area sources. We would suggest that the combined effects of emissions from generating plants and coal mines be discussed as to how it will impact the Northern Cheyenne and their Class I air quality redesignation. It appears from the discussion that there is every likelihood that power plant emissions, acid rains, etc., will adversely

1-8 **See the regional, volume 3, for responses to these comments.**

affect the environs of the Northern Cheyenne. The text should also discuss the precautions, monitoring, possible modification of mining plans, etc., that will be taken to insure that the air quality and other related values are protected and that the trust responsibility of the United States Government is fulfilled.

3 3. Page II-77. We suggest including a map to indicate locations of the various Indian events. Questions arise. For example, where did the Rosebud Creek battle occur after the Little Big Horn battle? General Crook was defeated at the head of Rosebud Creek in a battle with Northern Cheyenne and Sioux warriors five days before the battle of the Little Big Horn. This should be considered a battle of major importance because Crook was marching to meet the 7th Calvary. Custer could have been provided with a large additional force. What then would have been the outcome of the battle at Little Big Horn? The battle with General Crook took place on land now owned by Montana Rancher, Mr. Slim Kobold. Although the site has been marked by a Billings group known as Daughters of the Revolution, to our knowledge the site has never been proclaimed a State or National Park. A map and expanded discussion would clarify the issue.

4 4. Page II-78. Define miners as gold miners.

5 5. Page II-90. It may be noted that unemployment on the Northern Cheyenne Reservation took a rather sharp increase with completion of Colstrip generating Units I and II. An investigation of the statistics should show larger decreases in Indian labor at Colstrip than decreases in the number of non-Indian workers. The hiring and laying-off of large numbers of Indian workers by the Colstrip facilities has had negative influence on the Northern Cheyenne Tribe not discussed in the draft statements. We believe they should be considered.

6 6. Page II-104. Indians are served by Indian Health Service facilities at Lame Deer and Crow Agency. They maintain their own ambulance and hospital services. It should be noted that emergency care will be provided non-Indians for serious illness or accident.

An emergency helicopter ambulance service operated by Billings hospitals provides service to Southeastern Montana.

7 7. Page II-114. See our comments on the road between Busby and Decker under the Draft Environmental Statement for the Pearl Mine.

8 8. Page VIII-13. Reservation Employment - we believe this discussion should be expanded to detail the number of expected Indian and non-Indian workers employed at all of the Northern Powder River Basin Coal companies. Will these figures adhere to EEO and other labor standards? If not, what will be done to see that the expected number of Indians are employed? It is a known fact that when the labor force at Colstrip was shortened after completion of generating Units I and II an unnecessarily large percentage of Indian workers lost their jobs.

Proposed Mining and Reclamation Plan, Pearl Mine

9 1. Page I-16. Sewage - Sewage disposal at the mine could pose serious problems in the Tongue River Reservoir if State and Federal standards are not adhered to. Because the reservoir is used as a recreation area and a great deal of swimming and boating occurs no effluents should be allowed to enter a drainage leading into either the Tongue River or the reservoir. A large group of Northern Cheyenne people sponsor an annual three or four day camp out on the reservoir shores. A foolproof system of protecting the reservoir from effluents must be built into the sewage system.

10 2. Page II-42. Transportation Systems - it should be noted that since development of coal mining in the area to the east of the Crow Indian Reservation that on and off road travel has increased substantially on the reservation. In the event the Shell-Pearl Mine is approved it is anticipated that travel on restricted trust lands will increase significantly. This fact should be addressed in the EIS and proper steps taken by mining and other responsible officials in concert with the Crow tribe to eliminate this trespass.

11 3. Page III-3. Hydrology - the text states that portions of aquifers within the perimeter of the pit will be destroyed during mining and that large inflows would occur. The text also states that dewatering of the alluvial aquifer along Little Youngs Creek would occur both upgradient and downgradient from the South pit. We are extremely concerned as to these above-mentioned effects on the water supply of the Crow Indian Reservation in the area of this proposed mining operation. We would refer you to our comment No. 1 under the "Northern Powder River Basin Coal, Montana, EIS".

12 4. Page III-7. Hydrology - we suggest that a discussion on Mercury, Hg, should be included in this discussion. As you are aware, the element can have serious adverse effects upon fish, wildlife, and humans.

9 Comment noted; State and Federal standards would be adhered to.

10 Comment noted.

11 The alluvium of Little Youngs Creek does not extend into the Reservation. Hence, no potential effects are expected to occur within the reservation.

12 Although mercury can have adverse effects, its solubility in this region, due to pH levels, would be minimal to nonexistent. See page II-2, fourth full paragraph of volume 2.

13 5. Page III-26. Employment - we believe the EIS should include a discussion concerning the employment of Indians. Both Crow and Northern Cheyenne towns are in close enough proximity to the Pearl Mine to provide workers of various abilities. Because the Northern Cheyenne Tribe suffers an unemployment problem it seems logical to expect some relief from the establishment of new businesses. A case in point is the hiring of Indians at the generating facilities in Colstrip, Montana.

14 6. Page III-32. Highways - we believe a serious problem will exist because of mine caused traffic. The main access to the mine is an existing county road from Highway 338. Highway 338 ties into Highway 314 at a junction with the Decker mines. Highway 314 from Busby is not mentioned in the draft statements.

After establishment of the Decker mines, it was noted that Highway 314 assumed a tremendous burden of traffic. So much, in fact, that the old paved portion across the west boundary of the Northern Cheyenne Reservation was completely broken down in a period of about twenty four months. The road was in good condition in 1972. Because of the large volume of heavy traffic, the ruined black top had to be mechanically broken-up and eliminated. The road has not yet been rebuilt. That part of Highway 314 from the Reservation border to a point about six miles north of the Decker mines has always been dirt with some gravel surface. The section between the Decker mines and the Birney road was newly paved in 1973.

It may be possible that an increased traffic flow due to the Pearl Mine may further complicate maintenance of the reservation section of Highway 314. At present, that part of the road is maintained by the Bureau of Indian Affairs, Northern Cheyenne Agency, Branch of Roads. Maintenance has become an increasingly difficult problem due to rapid breakdown of the road. Indian livestock operators shipping cattle from home ranches along Highway 314 have been told by their truckers that they may stop hauling because of the road condition.

15 7. Page VIII-2. Air Quality - because of the long air distance (approximately 36 miles) to the Northern Cheyenne Reservation south border we do not believe particulate pollution of air, at the mine site, will be a threat to the Class I Air Standard of the Reservation. However, this matter is not discussed in the Draft Statement and we believe it should be studied. If particulates were to carry farther than 36 miles in north to northeast directions it is possible the air quality of the reservation

13 The company policy (Shell Oil Company, 1979) is to
- provide equal opportunity for all persons, consistent with employment requirements and qualifications;
- prohibit discrimination in all employment practices, because of race, color, religion, sex, national origin, age, physical or mental handicap, and status as a disabled veteran or veteran of the Vietnam era; and
- promote the full realization of equal opportunity through positive, continuing, Affirmative Action Programs.

Shell shall also, to the extent permitted under law, give priority right of employment to members of Indian Tribes. This would apply to members living on or near Indian reservations in the Pearl vicinity who are fully qualified and available to work.

14 Thank you for this information.

15 Insert: In as much as the Northern Cheyenne Reservation (a Class I airshed) is upwind and 36 miles from the proposed mine, it is unlikely that any particulate pollution from the mine would encroach upon the reservation. Wind vectors, analyzed on pages II-15 and II-17, indicate that the potential for particulate pollution exists only a few days a year. This is particularly so when wind velocity is taken into account. Generalizations on carrying distance are presented in table II-7.

would be harmed. The Class I Standards, monthly wind vectors and particulate carrying distances of fugitive dusts should be reviewed. If harmful effects become obvious then mitigating measures should be planned to alleviate them. If the Northern Cheyenne Class I Air Standard cannot be protected, then entering into the mining operation may become a gamble for the Shell Company.

16 8. Page V-1., briefly discusses that air quality, visibility, esthetic values, and stability of the ecosystem will occur in the vicinity of the mine site. The Crow Indian Reservation lies directly to the west of this proposal and presumably will be adversely affected by this proposal. This brings up several points that must be resolved: 1) the plan must be coordinated closely with the Crow Tribal Council, 2) a monitoring system for air quality and water quality and quantity should be set up on the reservation to measure any adverse effects, 3) a buffer zone of sufficient distance to reduce or eliminate the adverse effects of this proposal on the Crow Indian Reservation must be considered.

Acting Area Director

16 (1) Your opinion is noted.
(2) Air quality is being monitored on the Crow Reservation at the CIRL site (page II-8). All water quality and quantity data collected to date have included data from within the Crow Indian Reservation.
(3) Comment noted. A buffer zone is required between mining and all adjacent property owners.

OFFICE OF THE DIRECTOR

United States Department of the Interior
BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

September 12, 1979

DES 79/41

Memorandum

To: Director, Geological Survey

From: Director, Bureau of Mines

Subject: Draft environmental statement, Northern Powder River Coal Basin Regional Analysis, and Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana

A preliminary draft environmental statement, as well as the subject statement, have been reviewed by the Bureau of Mines representative on the Northern Powder River Basin EIS Task Force. Comments made for the preliminary draft have generally been incorporated in the current draft statement, and we have no further suggestions to improve this document.

Lindsay D. Norman
Assistant Director

Thank you for your comments.

LETTER 10

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

United States Department of the Interior

BUREAU OF RECLAMATION
Upper Missouri Region
P.O. Box 2553
Billings, Montana 59103

IN REPLY
REFER TO: UM-150

AUG 2 1 1979

Memorandum

To: Director, U.S. Geological Survey, Reston, Virginia

From: Acting Regional Director, Billings, Montana

Subject: Draft Environmental Statement, Development of Coal Resources in Southeastern Montana and Proposed Pearl Mine (DES 79-41)

1 The statements describe in-depth soils associated with the proposed mining operations and often refer to problem physical and chemical properties associated with many of the soils. It would be desirable to show actual laboratory analyses for the A through C soil horizons that indicate adverse soil conditions. If analyses are not available then horizons should be sampled and analyzed. Suggested screenable tests to be conducted would be: particle-size analysis, disturbed hydraulic conductivity, moisture retention, soil pH-1:5, EC and SAR values, trace element determinations and other tests deemed necessary.

2 The first sentence in Chapter VIII-4 of Volume II - Proposed Mining and Reclamation Plan, Pearl Mine states, "Limiting reclamation use of topsoil and nontoxic substrate to material not exceeding 2 ppm molybdenum content--the soil suspect level for the element." The state suspect level for selenium is 2.0 ppm but 0.3 ppm for molybdenum.

Robert H. Madsen

Robert H. Madsen

cc: Director, Office of Environmental Project Review, Office of the Secretary, Department of the Interior, Washington, D.C. 20240
Commissioner, Attention: 150

1 Actual lab analyses are on file with USGS, OSM, and DSL and are available for public and agency review.

2 Change this to 0.3 ppm molybdenum.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Billings Area Office
Federal Building, Room 3035
316 North 26th Street
Billings, Montana 59101

IN REPLY REFER TO:
CC

August 31, 1979

Director
U.S. Geological Survey
National Center, Mail Stop 108
Reston, VA 22092

Dear Sir:

This constitutes the FWS comments regarding the Northern Powder River Basin Coal and Proposed Mining and Reclamation Plan, Pearl Mine Environmental Statements.

With but one exception, these EIS's adequately cover impacts to fish and wildlife resources. The one exception is in the cumulative impacts assessment.

Cumulative impacts are mentioned somewhat casually, and admittedly, are hard to assess. However, with the level of impact occurring and projected, the FWS believes real emphasis should be made for planned development of the region. This will benefit not only fish and wildlife resources, but all disciplines as well.

Sincerely,

Robert M. Ballou
Acting Area Manager

cc: FWS/OEC, Washington D.C.

Thank you for your comments.

LETTER 12

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
DES 79/41

Memorandum

To: Director, Geological Survey

From: Director, Heritage Conservation and Recreation Service

Subject: Review of Draft Environmental Statement, Development of Coal Resources in Southeastern Montana

We have reviewed the above document in accordance with your July 13, 1979, memorandum. Recreational and natural resource concerns appear to have been adequately addressed; however, we have the following comments concerning treatment of cultural (historic and archeological) resources.

1 It appears that considerable historic and archeological resource identification and evaluation has already taken place. However, the final environmental statement should document the results of all National Register determination of eligibility requests and all consultations with the Montana SHPO and the Advisory Council on Historic Preservation concerning mitigation of adverse effects. This includes the results of the Section 106 evaluation and consultation process for Devastation Shelter in the Pearl Mine area, as well as documentation of the Advisory Council's finding of "no adverse effect" for the Bunny Chase Archeological Site.

2 We note that the Regional Analysis volume (p. II-125) contradicts the Pearl Mine Area analysis (p. II-44) concerning the potential National Register eligibility of 14 archeological sites in the Pearl Mine area. The final statement should clarify this discrepancy.

3 Finally, the final statement should briefly discuss the survey methods used and actual area surveyed in the proposed Pearl Mine area. It is unclear from the draft statement whether the rail spur, relocated roads, transmission corridors, and other ancillary facility areas were included in the survey work. The final statement should clarify this to insure complete fulfillment of National Historic Preservation Act requirements.

Thank you for the opportunity to comment.

for Harold Green
Chris Therral Delaporte

1 Thank you for your comment. Full documentation of these requests and consultations is beyond the scope of this document; such documentaiton is on file with the Office of Surface Mining, the Advisory Council on Historic Preservation, and other appropriate agencies.

2 Page II-125 (volume 1): change "eligible" to ineligible.

3 Comment noted. The rail spur and transmission were included, as were the areas for road relocation and ancillary facilities. Please contact either the State or District BLM office, or the company, for a copy of the report.

Page II-44(N): Insert at end of first paragraph: The survey area included all lands disturbed by associated facilities and activities, as well as by the actual mine pit area.

United States Department of the Interior

OFFICE OF SURFACE MINING
Reclamation and Enforcement
WASHINGTON, D.C. 20240

Memorandum

To: Director, U.S. Geological Survey

Through: Assistant Secretary--Energy and Minerals

From: Acting Director

Subject: Review of Draft Impact Statements

The Office of Surface Mining has reviewed the draft environmental impact statements entitled "Northern Powder River Basin Coal, Montana (Regional Analysis)," and "Proposed Mining and Reclamation Plan, Pearl Mine, Montana" and has the following general comments. Detailed comments are presented in Appendix A for the Regional Analysis and in Appendix B for the proposed Pearl mine.

1 The draft regional analysis adequately discusses the broad impacts that could occur from increased coal development in the study area. However, because protection of alluvial valley floors in the West is a major feature of SMCRA, the final regional analysis should evaluate the potential cumulative adverse impacts of mining operations on alluvial valley floors--to the extent that this evaluation is possible. A map showing potential alluvial valley floors in the study area should also be included in the regional analysis.

2 There are some potentially significant impacts which cannot be properly assessed by the information presented in the draft Pearl Mine Plan. The draft indicates (on p. II-10, III-8) that the existence of alluvial valley floors in the permit area has not yet been determined, therefore the impacts of mining on such lands have not been evaluated. The designation of Little Youngs Creek and Youngs Creek valleys as "alluvial valley floors" under SMCRA would require significant modification of the Pearl Mine Plan. Any alteration of the mine plan that was not addressed in the FES would require at least an environmental assessment and might require the preparation of a supplemental EIS if the alteration causes significant impacts. The plan implemented upon designation of alluvial valley floors within the Pearl Mine site should be discussed as an alternative to the proposed plan. With this, the impacts will be assessed and proper mitigating measures revealed.

3 The diversion of Little Youngs Creek in the Pearl Mine site may have significant environmental impacts. Data relative to the dimensions, slope, construction material, and length of diversion should be evaluated in the FES to insure that the impacts of that diversion are considered.

1 See the regional, volume 3, chapter IX, letter 15 for a discussion of cumulative adverse impacts to alluvial valley floors and for a geologic map of potential alluvial valley floors; see also Malde and Boyles (1976).

2 (1) Designating of alluvial valley floors is not the function of the EIS. As required, however, the potential for designation was pointed out.

(2) There is no alternate mine plan. To quote Shell,[1] "Our present mining and reclamation plan commits us to special handling and replacement of the alluvial material in and adjacent to Little Youngs Creek. This procedure should ensure that the essential hydrologic functions of this intermittent stream will be preserved. Therefore, there should be no reason to preclude the mining of the Little Youngs Creek over the short distance proposed in our current mining plan."

(3) Volume 2, page VIII-2, points out that one option is to not mine Little Youngs Creek. The obvious reduction of impacts was pointed out on page VIII-1, last sentence.

3 Comment noted. See chapter I of this volume.

---

[1] Shell Oil Company, August 23, 1979, Testimony at public hearings on DES 79-41, Sheridan, Wyoming. On file at the Montana Department of State Lands. See letter 24.

4 Other incomplete hydrologic studies mentioned in the draft Pearl Mine Plan should be completed for inclusion in the FES (see attached comments). Such studies are necessary in determining the rate of flow into the pit (and consequently discharge into Youngs Creek), the effects of lower water levels in the alluvium of Little Youngs Creek, and the impacts of mining on ground water quality.

Attachment

4 **These studies are being completed, and data are in the application, on file with OSM and DSL.**

Attachment

Detailed Comments on the Draft Pearl Mine Plan

1 1. Page I-1, paragraph 4, line 7--Change "Mine Control and Reclamation Act" to read "Mining Control and Reclamation Act."

2 2. Page I-1, last paragraph, last line--Add "Mining Control and Reclamation Act" to the end of the sentence.

3 3. Page I-23, paragraph 2, line 5--How would runoff and sediment from the stockpile be prevented from flowing off the permit area?

4 4. Page II-9, paragraph 6, line 12--Data from additional studies on ground water in the permit area should be included in the FES.

5 5. Page II-10, paragraph 1--Since a determination has not been made as to the designation of alluvial valley floors in the permit area, an alternative to the proposed mine plan should be included in the FES describing the modifications of the plan if such valleys are present.

6 6. Page II-11, Figure II-4--Potential alluvial valley floors should be designated.

7 7. Page II-12, paragraph 1 and 2--Additional hydrologic studies are necessary to determine the water quality of the aquifers in the permit area (including the sandstone bed aquifers).

8 8. Page III-1, paragraph 3--The impacts of the diversion of Little Youngs Creek cannot be properly assessed with out the knowledge of its design.

9 9. Page III-2, paragraph 6--See comment no. 8.

10 10. Page III-4, paragraph 4--See comment no.8.

11 11. Page III-6, paragraph 3--Further hydrologic studies should be conducted as to the impacts of lower water levels in the alluvium of Little Youngs Creek. Data from these studies should be included in the FES.

12 12. Page III-7, paragraph 3--Ongoing hydrologic studies should be completed and data gathered should be included in the FES.

13 13. Page III-8, paragraph 4--See comment no. 5.

14 14. Page III-19, paragraph 2--The percentage of original species in the seeding mixture may be increased by handpicking of indigenous seed prior to mining.

1 Change as noted.

2 Add as noted.

3 Runoff and sediment from the stockpile would be collected and directed to the settling ponds, as shown in figure I-8, page I-13 of volume 1.

4 Comment noted. Cataloging of data in an EIS is unnecessary to the evaluation of impacts; this data is on file in the application with the MDSL and OSM.

5 The mine plan presented is the proposed plan whether or not Little Youngs Creek is designated an alluvial valley floor under SMCRA.

6 Comment noted. See response 2, in the first part of this letter.

7 These studies are being conducted by the company now. See appendix C of volume 2.

8 Comment noted; see chapter I of this volume.

9 Comment noted.

10 Comment noted.

11 Further hydrologic studies are being conducted by the company at the request of the Montana DSL and OSM.

12 See response 11.

13 See response 5.

14 Comment noted.

15 15. Page III-5, Table III. 1--Change "sediment yield of reclained areas" to read "sediment yield of reclaimed areas."

15 Change as noted.

16 16. Page III-19, Footnote 7--Change "sec. 519(b)" to read "sec. 515(b)(19)."

16 Change as noted.

U.S. DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
4015 Wilson Boulevard
Arlington, Virginia 22203

Dr. H. William Menard
Director, U. S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

Dear Dr. Menard:

This is in response to Dr. J. R. Balsley's letter of July 13, 1979, requesting our comments relative to your draft environmental statements on the Northern Powder River Basin and the Pearl mine in Montana.

The statements seem to be very comprehensive in defining, analyzing, and evaluating the probable impacts of the proposed actions. None of the described environmental, socioeconomic, or operational factors should affect our programs other than to require us to conduct additional inspection and enforcement activities in this region whenever new mining operations begin.

We thank you for this opportunity to comment on your statements.

Sincerely,

Robert B Lagather

Robert B. Lagather
Assistant Secretary
for Mine Safety and Health

Thank you for your comments.

LETTER 15

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER COLORADO 80203

NOV 5 1979

Ref: 8MO

Mr. H. William Menard
Director, U.S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

Dear Mr. Menard:

1 We have completed our review of the draft environmental impact statement for the Northern Powder River Basin Coal, Montana, and for the Proposed Mining and Reclamation Plan, Pearl Mine, Montana. The Northern Powder River Basin regional EIS describes the environmental impacts that can be expected from the development of surface coal mine operations in the area which are currently being evaluated by Federal agencies. The EIS also describes impacts resulting from operation of the Colstrip power plant. The EIS does not attempt to analyze impacts from future proposed mining activity. A more complete analysis of the regional cumulative hydrologic/water quality impacts should have been provided. Water quality and water resource impacts on the Tongue River drainage system resulting from the low, intermediate and high coal projections should be analyzed.

Additional specific comments are as follows:

2 1. The air quality discussion on BACT for mines is outdated. The recent Alabama Power et. al. vs EPA decision essentially exempts surface coal mines from PSD review.

2. The air quality discussion for the Colstrip power plant is outdated and inaccurate. A PSD permit requiring SO_2 emission rate of 0.18 #10^6 BTU (24 hour average) was recently issued. The power plant NSPS were revised in June 1979.

3 3. High concentrations of mercury have been found in the Tongue River Reservoir. We have a concern regarding the exacerbation of this situation.

4 As stated in the EIS, this region of Montana can expect significant environmental and social change and damage from accelerating industrialization of a presently rural area. With proper application of state and local law, however, these impacts can be controlled and mitigated to some degree.

According to EPA's rating system, this regional EIS is rated ER-2 (environmental reservations - insufficient information).

1 Thank you for your comments. See volume 3 for a specific response to this comment.

2 Thank you for providing this updated information; it was not available at the time the draft was printed.

3 Please see volume 3.

4 Please see volume 3.

LETTER 16

5 The Pearl Mine EIS describes another situation where air quality, wildlife, water quality, social and economic values will be impacted and, in many cases, damaged. However, the EIS suffers from having to discuss an outdated mining and reclamation plan. An updated version is currently awaiting the review of OSM. Since the EIS does not address a current situation, we suggest that a supplemental EIS be prepared in conjunction with the OSM review. We offer the following observations on the project as described.

6 1. Mining in an alluvial valley floor is the major issue. The mine plan must reflect due consideration to alluvial valley floor requirements if determined to be applicable by OSM under SMCRA.

7 2. Diversion of Little Youngs Creek may cause water quality impacts unless the diversion is properly designed. There is no information in the EIS to evaluate the design.

8 3. Since there are no existing contracts for the coal, is the project necessary? It has been stated that the coal mining capacity is greater than present demand by about 150 million tons per year.

9 4. Stronger commitment to air pollution control should be provided including use of chemical dust suppressants on haul roads, paving of access roads, use of baghouses on coal crushing and conveying, stabilization of topsoil, etc. should be stipulated.

The EIS is rated ER-2 (environmental reservations - insufficient information). The 2 rating refers to the lack of an adequate mining plan.

If you have any questions, please contact Mr. Gene Taylor of our Montana Office at FTS 585-5432.

Sincerely yours,

Roger L. Williams
Regional Administrator

5 The mine plan discussed in the Pearl mine DES has had minor changes in order to be brought into compliance with SMCRA. It is probable that additional information or modification could be required prior to permit approval. Volume 2 and this volume present a worst-case situation relative to mining through Little Youngs Creek. If the regulatory agencies prohibit the disturbance of this creek, overall impacts would be decreased from those discussed in volume 2.

6 The regulatory agencies have not made a determination as to the applicability of the Alluvial Valley Floor Provisions of SMCRA. However, impacts, as projected in volume 2, would not change.

7 See chapter I of this volume.

8 Comment noted. Unless mining companies have a permit to mine inhand, they often cannot obtain contracts for coal. Present demand does not take into account future changes in policy, needs, etc. Obviously the company would not mine 46.5 million tons of coal without contracts. Regulatory agencies cannot deny an application on this basis and cannot determine markets for coal.

9 The EIS cannot make this commitment. The appropriate State and Federal regulatory agencies may require your suggested measures as stipulations to permit approval.

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

Helena, MT 59601
July 31, 1979

re: DES on Proposed Mining and Reclamation Plan, Pearl Mine,
Big Horn County, Montana

Director
U. S. Geological Survey
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

We have reviewed the Pearl Mine DES and find it to be an acceptable document. There do not appear to be any major flaws in the wildlife and impact sections.

Thank you for the opportunity to review this document.

Thank you for your comments.

Sincerely,

Robert R. Martinka

Robert R. Martinka, Chief
Bureau of Baseline Studies

RRM/sd

cc: Environmental Quality Council
Clearinghouse, OBPP
Keith Seaburg

MONTANA HISTORICAL SOCIETY

HISTORIC PRESERVATION OFFICE

225 NORTH ROBERTS STREET • (406) 449-4584 • HELENA, MONTANA 59601

August 23, 1979

Geological Survey, National Center
Mail Stop 108
Reston, VA 22092

RE: 79-07-01
Northern Powder River Basin Coal,
Montana Proposed Mining and Reclamation
Plan, and Draft Environmental Statement,
Pearl Mine, Big Horn County, MT

Dear Sirs:

Your Draft Environmental Statement on the Northern Powder River Basin Coal in Montana points out a serious problem in cultural resource management of the area. As little survey work has been done, it is difficult to evaluate the significance of a few sites on any one impact area.

On January 18, 1979, Ed Zaidlicz, State Director of the Bureau of Land Management corresponded with the Office of Surface Mining, and pointed out deficiencies in the survey of the impact area of the Pearl Mine. I have no documentation that this work was ever completed. Compliance with Section 106 of the Historic Preservation Act is not complete. Determinations of eligibility have been requested only for the Bunny Chase site 24BH1574. Determination requests must be made for all other sites in the project area before consultation with the Advisory Council can begin.

I encourage you to begin the compliance procedures as soon as the inventory work is completed so as not to delay this aspect of environmental review.

Sincerely,

Edrie Vinson

Edrie Vinson, Program Manager
for
Ken Korte, State Historic Preservation Officer

EV/prb

cc State Clearinghouse

Thank you for your comments. Section 106 of the Historic Preservation Act would be completed prior to mining.

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

LAND QUALITY DIVISION

HATHAWAY BUILDING TELEPHONE 307-777-7756 CHEYENNE, WYOMING 82002

Mr. H. William Menard, Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, VA 22092

RE: Draft Environmental Statement, Shell Pearl Mine, Montana, DES 79-41

Dear Mr. Menard:

The staff of the Land Quality Division, Wyoming Department of Environmental Quality has reviewed the draft Environmental Statement of the Shell Pearl Mine in regard to its environmental effects on Wyoming.

1 I am concerned that even though an estimated 291 acres will be affected in Wyoming by a rail spur, we were not contacted regarding this proposed project. It should be noted the Land Quality Division is responsible for permitting and enforcement of reclamation laws, including the Surface Mining and Control Act of 1977, for all mining operations in the State of Wyoming.

According to the Draft Environmental Statement, the rail line will affect 291 acres, cross 4 county roads, 1 state highway, and 4 streams in the State of Wyoming alone. There will be considerable impact resulting from erosion along the newly constructed railroad bed and disruption of stream habitat from the construction of the stream crossing structures. Improper fencing of the spur right-of-way may cause disruption of big game animal migratory patterns.

Also, the crossing of the county roads using on-grade crossings will inconvenience and perhaps endanger the traveling public.

2 I have determined that this proposed rail spur meets the definitions of the Wyoming Environmental Quality Act regarding affected lands and mining-related operations. Therefore, Shell Oil Company will be required to apply for a permit to mine from the Land Quality Division. This will mean for that portion of the rail line located within Wyoming, Shell will be required to salvage topsoil, revegetate the affected areas and fence the rights-of-way to Wyoming standards. The permitting process will also require the posting of a reclamation bond and subject the rail spur construction to the public notice and hearing provisions of the Wyoming Environmental Quality Act.

1 Thank you for your comments. As noted on page I-4, table I-1 of volume 2, DEQ is responsible for permitting those portions of the company's proposal which would affect Wyoming. The Montana Department of State Lands has contacted the Land Quality Division of the Wyoming Department of Environmental Quality to coordinate regulatory functions.

2 Shell will apply for permits from the Wyoming Department of Environmental Quality and meet its requirements.

H. William Menard
Page Two

Another area of concern is the proposed construction of a diversion channel for Little Youngs Creek which would connect with an existing diversion channel belonging to the Ash Creek Mine. This channel would affect land belonging to the Bureau of Land Management upon which no State permit exists. Construction of this channel would require a permit from the Department of Environmental Quality. Equally, any overstripping which would occur in Wyoming as a result of mining operations in the south edge of the south pit would require a permit and bonding.

3 Specific comments on the Pearl DES are attached. These comments reflect the Division's concern for potential environmental and agricultural impacts to Wyoming as a result of the proposed operation. I encourage you to contact my staff for more detailed input. Your agency should realize that our processing a permit for disturbances which will occur in Wyoming could result in alternations to those conditions shown in the DES.

3 **Any alterations required by Wyoming would presumably serve to decrease impacts.**

Sincerely,

W. C. Ackerman

Walter C. Ackerman
Administrator

WCA:sh
Attachment
cc: Albert Iresom
Shell Oil Company

Leo Berry Jr.
Montana Department of State Lands

Attachment - Comments on Pearl Mine DES, Prepared by the U.S. Geological Survey and the Montana Department of State Lands, 1979.

Following are specific comments on the referenced DES. These comments reflect the Land Quality Division, Wyoming Department of Environmental Quality's concern with the proposed operation as it relates to the responsibilities of the Division and anticipated impacts to Wyoming.

1 I. RE: Railroad Spur

The 291 acre railroad spur will require a permit-to-mine prior to construction. The railroad alignment, as proposed in figures I-8 and I-9, will cross several streams, one major drainage, county roads, a state highway and lands of agricultural and wildlife importance. Impact to the hydrologic balance also warrants concern. The DES fails to recognize the associated impacts and discuss mitigative measures.

2 II. RE: Alluvial Valley Floors

The DES does not include discussions on alluvial valley floors. The railroad spur and mine plan, as proposed, will affect alluvial valley floors associated with Little Youngs Creek, Youngs Creek and the Tongue River. Alluvial valley floors on Ash Creek and Prarie Dog Creek, should they exist in the area of disturbance, could also be impacted.

3 III. RE: Adjacent Mines

The Pearl Mining operation shall be conducted adjacent to the Ash Creek Mine which is located in Wyoming (see the attached map). The DES fails to describe the accumulative impacts of the two operations nor does it describe procedures whereby the two operations will be conducted and reclaimed in a consistent manner. Areas requiring specific evaluation include:

1. Accumulative impacts to and restoration of the hydrologic balance.
2. Preservation of essential hydrologic functions and material damage to alluvial valley floors on Little Youngs Creek and Young Creek.
3. Restoration of the essential hydrologic functions on Little Young's Creek.
4. Dewatering effects on Little Youngs Creek and the Ash Creek Mine Diversion.
5. Blending of final contours and land uses.
6. Selective handling and disposal of saline-sodic spoil in the mine area.

4 IV. RE: Relocation of County Road

The "old county road", as shown on Figure I-7, is improperly shown in the southeast portion of the figure. The existing road runs along the section lines of sections 22 and 23.

1 Hydrologic impacts from the rail spur are discussed on page III-3 of volume 2.

Vegetation impacts discussed in volume 2 apply both to the mine and rail spur areas which are stripped of vegetation. Impacts to the rail spur vegetation, however, would be of shorter duration due to the smaller acreages and the lesser disturbance involved. The seed mixture to be used in the rail spur cuts is given on page I-31 of volume 2.

Wildlife impacts are discussed in volume 2 on page III-21, paragraph 1: "In addition, the rail spur would bisect two winter ranges;" and paragraph 4: "To the south the rail spur bisects a portion of two winter ranges." See page III-22, paragraph 7 and page III-24, last paragraph for further discussion.

Land use impacts are described in volume 2 on page III-29, paragraph 4.

Transportation impacts are described at the bottom of page III-32 and at the top of page III-33 in volume 2.

2 Comment noted. Any disturbance to an alluvial valley floor from the construction of a rail crossing is likely to be localized and to have little if any impact on the hydrologic functioning of an alluvial valley floor.

3 SMCRA and the Montana Strip and Underground Mine Reclamation Act define procedures for conducting the mining and reclamation at Pearl. There should be little cumulative impact to hydrologic balance. Shell currently plans to evaporate excess pit discharge from the settling ponds.

(1, 2) Because the Ash Creek mine disturbed Little Youngs Creek prior to the passage of the Federal Surface Mining Control and Reclamation Act, it is unlikely that the essential hydrologic functions and balance of Little Youngs Creek in the Ash Creek mine area can be preserved. The company intends to prevent permanent material damage to Little Youngs Creek from the Pearl mine. The cumulative effect of Pearl on Ash Creek should not be significant.

The proposed "relocated county road" would diagonally cross crop and hay-lands associated with the Little Youngs Creek drainage, (Section 23) disrupting the use of these lands for intensive agricultural purposes. Alternative routes should be investigated.

5 v. RE: Overburden Quality

The Division has found anomously high levels of DTPA extractable lead and has required Ash Creek Mine to specially handle these materials. The stratum of high lead are generally associated with the saline-sodic materials of the overburden.

3 The quantity and quality of water in Little Youngs Creek from Montana to Wyoming would probably be unchanged. Significant changes in either quantity or quality, due to mining, would have to be mitigated by the company as required by Montana, Wyoming, and Federal regulations.

Because the alluvium of Youngs Creek (east of both mine areas) would not be disturbed, little impact to the hydrologic balance should occur; thus restoration should not be necessary. The essential hydrologic functions and materials of the alluvial valley of Youngs Creek would also likely be preserved, since no one proposes to mine through Youngs Creek at this in time. See volume 2, page III-8, second and third full paragraphs.

(3) The company intends its mine and reclamation plan to restore the essential hydrologic functions of Little Youngs Creek. See letter 14 (this volume), response 2. As stated on page III-6 in volume 2, "Further hydrologic investigations are required to determine other impacts." Neither data nor experience is sufficient to determine whether the plan would succeed or fail.

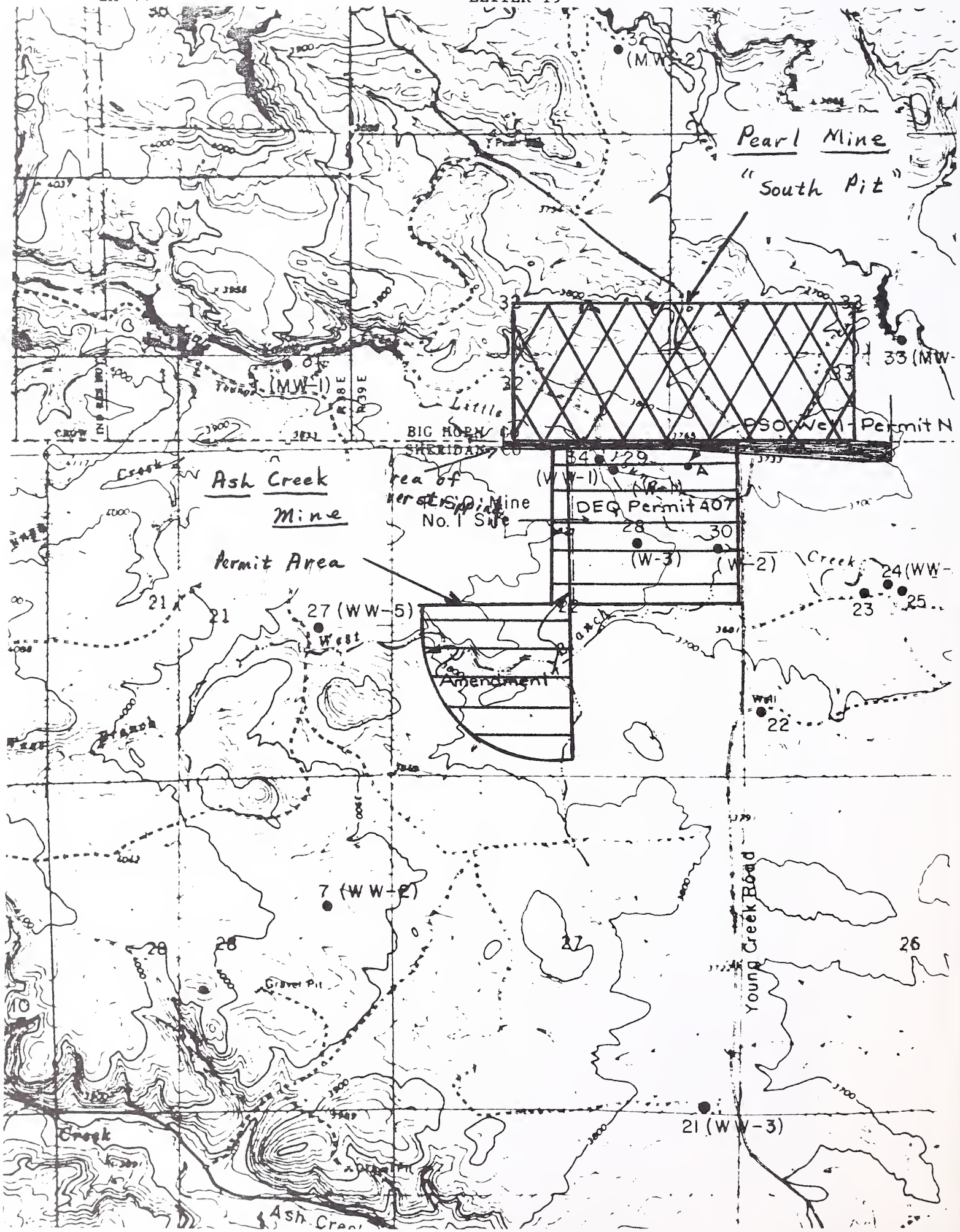
(4) The effect of dewatering Little Youngs Creek is described in volume 2 on page III-3 and III-4. More detail is given on page III-6, 3d paragraph and page III-8, first 3 full paragraphs.

(5) To date, the Ash Creek and Pearl mines do not intersect. The final contours of the Pearl mine would be returned to the approximate original contours, and the area would be returned to its existing uses--grazing and wildlife. This is compatible with the land use and topography to the west, north, and east. Since the Ash Creek mine must now comply with SMCRA, its final topography and use should be compatible with those of the Pearl mine. If not, the Pearl plan would not be changed to adapt to the Ash Creek proposed contours and uses.

(6) As stated in chapter I, Shell will selectively salvage such materials. Whether or not this is done at the Ash Creek mine is irrelevant to this proposed action.

4 Comment noted. See volume 2, page III-18, third paragraph, number (4), and pages VIII-4 and VIII-5.

5 Comment noted.


Pearl Mine
"South Pit"
(MW-1)
Little
BIG HORN CO
SHERIDAN CO
Ash Creek
Mine
Permit Area
DEQ Permit 407
No. 1 Site
(W-1)
(W-2)
(W-3)
27 (WW-5)
West
Amendment
24 (WW-
7 (WW-2)
21 (WW-3)
Young Creek Road
Gravel Pit
Creek
Ash Creek

WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

ED HERSCHLER
GOVERNOR

September 7, 1979

Mr. H. William Menard, Director
U.S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Mr. Menard:

1 This is in reference to the two volume draft environmental statement for coal development in the Northern Powder River Basin, Montana, (DES 79-41). The documents have been reviewed by our interested state agencies. Copies of comments and questions provided by our Department of Environmental Quality are enclosed for your consideration and use.

The environmental statement estimates that approximately 75% of the Big Horn County, Montana miners would reside in the Sheridan, Wyoming area. Such a population influx would obviously create socio-economic and environmental impacts in the Sheridan area which would have to be dealt with by Wyoming local and state officials.

The statement also indicated that the south pit of the proposed Pearl Mine will be located directly adjacent to the Wyoming - Montana state line. This proposed location, coupled with the fact that many bio-physical parameters such as drainage areas, surface and underground waters and wildlife migration routes overlap the states boundaries, presents a somewhat unique situation. While the mining is to be conducted wholly in Montana, it appears that many of the potential socio-economic and environmental impacts will occur in Wyoming.

In view of the above, I would like to see the State of Wyoming more directly involved in the analysis of this potential mining plan. There are many questions left unresolved in the draft statement. I believe that these questions can best be addressed through a joint effort involving both the States of Montana and Wyoming and the U.S. Geological Survey. I encourage such an

1 **Thank you for your comments. The State of Montana and the Office of Surface Mining will be working with the State of Wyoming prior to permit approval.**

effort and request that any further action on this proposal be closely coordinated with my office.

Yours sincerely,

Ed Heuller

EH:pcd

attachment

cc: Mr. Leo Berry, Jr., Commissioner
Montana Department of State Lands
1625 11th Avenue
Helena, Montana 59601

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

Water Quality Division

HATHAWAY BUILDING CHEYENNE, WYOMING 82002 TELEPHONE 307 777-7781

M E M O R A N D U M

TO: Robert E. Sundin, Director, Department of Environmental Quality

THROUGH: William L. Garland, Administrator, Water Quality Division

FROM: A. J. Mancini, Environmental Engineer, Water Quality Division

DATE: August, 17, 1979

SUBJECT: Comments on Draft Environmental Statement, "Proposed Mining and Reclamation Plan, Pearl, Mine, Big Horn County, Montana".

The Pearl Mine is a proposed surface coal mine in southern Montana, in the vicinity of the State line between Wyoming and Montana. The "south pit" for the proposed mine apparently will be constructed on the State line.

Reportedly, a revised plan has been submitted, to reflect requirements of new regulations, but has not yet been reviewed by the Office of Surface Mining and the Montana Department of State Lands.

2 Since the south pit is shown as being on the State line, it might be anticipated that there would be some coordination of regulatory authorities in Montana and Wyoming; however, there is no indication of this, other than a request for comments from the Office of Governor Herschler. If there are coal lands in Wyoming adjacent to the south pit, these lands will be afficted by activities in Montana. As an example, the E S includes (Figure I-14) a map showing postmining contours for the south pit. Contour lines stop at the State line (reclamation could and probably will affect lands in Wyoming even if these are not coal lands).

3 Table II-1, on page II-5, indicates that there is a Federal livestock standard for nitrate-nitrogen in water; I have not been able to verify this, and doubt if there is such a Federal standard. Verification or correction in the E S is required.

4 An analysis of social impacts in the E S indicates a significant impact to Sheridan County (Wyoming), and a decline in the well-being of persons living in the area. In view of this and a pervious observation concerning mining on the State line, I believe the State of Wyoming should be directly involved in an analysis of the mining application.

2 The State of Montana has initiated coordination with the State of Wyoming. Volume 2 describes the most likely effects of reclamation on land in Wyoming. See responses 1 and 3 in the attachment to letter 19.

3 This should be changed to threshhold standard. The recommended Federal livestock standard (EPA, 1972) is 10 ppm.

4 See response 2 above.

Memo
Robert E. Sundin
August 17, 1979
Page 2

5 There is a topic which is not covered in the E S, and should be discussed so as to complete an evaluation of impacts to water resources. This topic is the Yellowstone River Compact, the signatory States being Wyoming, Montana and North Dakota. What effect will the impacts to surface water resources have on Wyoming's allocated water of the Tongue River drainage?

6 Closely related to this topic is a question of the affect on the water quality in Wyoming, since Wyoming is "down-stream" from the mine. Will the operator have to meet Wyoming water quality standards? Will groundwater quantity and quality on the Wyoming side of the State line be monitored? Will the State of Montana provide Wyoming with data obtained by a monitoring program on the Montana side of the State line?

/jn

5 There should be little or no effect to surface water resources on Wyoming's allocated water of the Tongue River drainage. See volume 1, page IV-6, chapter II, Hydrology.

6 Data supplied to the Montana Department of State Lands are public information and are available to the State of Wyoming. Water quantity and quality would be monitored at the discharge point and would meet all applicable State and Federal standards. Coordination should be maintained between the states of Montana and Wyoming for the life of this mine.

THE STATE OF WYOMING

AUG 3 0 1979

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

Water Quality Division

HATHAWAY BUILDING CHEYENNE, WYOMING 82002 TELEPHONE 307 777-7781

M E M O R A N D U M

TO: Robert E. Sundin, Director, Department of Environmental Quality

THROUGH: William L. Garland, Administrator, Water Quality Division

FROM: A. J. Mancini, Environmental Engineer, Water Quality Division

DATE: August 17, 1979

SUBJECT: Comments on Draft Environmental Statement, "Northern Powder River Basin Coal, Montana".

7 There isn't much in this statement concerning water resources which relates to Wyoming. Chapter IV, "Impacts", does include estimates of potential impacts to Sheridan, Wyoming. It appears that Sheridan might have to obtain storage space for water, to prevent impacts on downstream (Montana?) water users because developments in Montana will require more municipal water to be provided by Sheridan. The State of Wyoming would want to keep abreast of Montana developments which cause an increase in Sheridan's population. If new water storage is needed, perhaps it could be constructed to store "Montana water" that normally would be stored in the Tongue River Reservior.

/jn

7 Comment noted.

Shell Oil Company

Two Shell Plaza
P.O. Box 2099
Houston, Texas 77001

September 4, 1979

The Director
U. S. Geological Survey
National Center
Mail Stop 108
Reston, Virginia 22092

Dear Sir:

1 Shell Oil Company presented oral comments on the Draft Environmental Statement for the "Proposed Mining and Reclamation Plan, Pearl Mine, Big Horn County, Montana" at the public hearing held in Sheridan, Wyoming on August 23, 1979. A number of typographical and other minor errors, as well as suggested corrections, on the Draft EIS were discussed with members of the Federal EIS Task Force. In addition to our oral statement we wish to make the following general and specific comments on the Draft EIS for our proposed Pearl Mine.

2 We originally submitted our application for a mining permit in June, 1977 to the Department of Interior in accordance with 30 CFR 211 Coal Mining Operation Regulations. Our application was revised to comply with Montana's Strip and Underground Mine Regulation Act and submitted to the Montana Department of State Lands in January, 1978. The Mining and Reclamation Plan in the application was again revised in April, 1979 to meet certain deficiency questions raised by the Montana Department of State Lands and to comply with Montana's interim regulations which were drafted following passage of the Federal Surface Mining Control and Reclamation Act. Supplemental information on our Mining and Reclamation Plan was supplied in August, 1979. We believe that only minor changes in our application will be required to meet the requirements of Montana's new permanent regulations as well as those of the Office of Surface Mining.

The Draft EIS makes many references to there being insufficient data and/or information available to analyze completely the possible impacts of Shell's proposed mining and reclamation plan for the Pearl Mine. In particular, the diversion of Little Youngs Creek, the proposed mining and reclamation of Little Youngs Creek, the proposed method of salvaging topsoil and hydrology are areas the EIS found lacking in sufficient data. Additional data and information has been submitted with our revised application of April, 1979 and in the supplemental data supplied in August, 1979. We believe that this revision and supplemental data should be reviewed and analyzed for the final EIS for the proposed Pearl Mine.

Following are specific comments on the Draft EIS for the Pearl Mine:

1 Thank you for your comments.

2 The State and OSM will fully review the revision and supplemental data. The data submitted in August 1979 arrived too late to incorporate into the draft, which was published in July 1979. The diversion is discussed in chapter I. Other data are discussed in response to the following questions.

3 1) Page I-12, Railroad Spur and Loading Area

The second sentence of this paragraph is misleading. Shell has obtained a 200 feet R.O.W. not a one-half mile corridor. The one-half mile corridor referred to in the EIS is the area covered by our environmental studies.

4 2) Page II-9, 2. Ground Water a. Aquifers

Information submitted with Shell's application shows that there are no sandstone aquifers and that the "O" and "R" coals seams are not significant aquifers.

5 3) Page II-24, Soils

The fourth sentence of the first paragraph states that the actual topsoil resource available can not be accurately calculated from the information provided. In the April, 1979 revised application, the actual topsoil resource available has been calculated and presented in tabular form.

6 4) Page III-1 & 2, 1. Topography and Geomorphology a. During mining

Paragraph three states that stream incision should be avoided, but to comply with State and Federal regulations it is necessary to treat the discharge waters to a quality which has less sediment than normal stream waters. However, based on our pit inflow calculations of ground water, there will be only a small amount of discharged water. Most of the pit inflow water will be stored in the sedimentation pond and used for haulroad dust suppression and other uses. Therefore, the potential for stream incision is minimal.

7 5) Page III-9 & III-11, Air Quality 1. Introduction

This paragraph is rather confusing. It takes data from a regional model for Colstrip, Montana using partially controlled emissions and discusses the resultant emissions at length. The paragraph further states that if Best Available Control Technology (BACT) were used, particulate emissions would be reduced significantly. Shell is committed to the use of BACT.

8 6) Page III-22 3. White-tailed deer

Shell's Mining and reclamation plans show that we are not disturbing 100 acres or more of riparian habitat along Little Youngs Creek and Youngs Creek. The only riparian habitat disturbed is where mining along Little Youngs Creek will take place. The riparian habitat disturbed will only be approximately a tenth of what is stated in the EIS.

3 Change this sentence to read: "Shell has obtained a 200-foot wide right-of-way for this purpose."

4 Comment noted. Volume 2 states we have no data on these seams; however, Shell's cross sections show several sandstone beds in the interburden, which we assume have the potential to yield water.

5 The problem related to soil volume is the use of soils derived from the Little Youngs Creek alluvial valley floor simultaneously for both the reconstruction of the valley floor and for general reclamation. Soils and alluvium taken from the valley floor are to be used in reconstructing the valley floor. However, the volume of these soils is not subtracted from the total soil volume available for reclamation of the remaining area to be disturbed. Since these alluvial soils constitute over half of the salvageable "topsoil" resource, but occupy only 16 percent of the area, it is apparent that a reduction in the area providing alluvial soils for salvage would be significant.

6 Comment noted. These points are addressed in the text.

7 Air quality: This paragraph assumes emissions from the proposed Pearl mine would approximate those from the existing Big Sky mine: the production rate at Pearl would be about 2 million tons per year (mty) while the present production at Big Sky is 2.3 mty.

The regional model is a modification of models used by EPA and was the model available for projecting emissions. It is believed that these models tend to underestimate potential fine particulate problems. Appropriate qualifers were used in applying the model to Pearl.

EPA and the Montana Department of Health and Environmental Sciences working in conjunction with the company have not yet defined BACT. Lowest achievable emisson rates would be most desirable, but also the most expensive.

8 Insert after "* * * possibly Youngs Creek,": (although a much smaller acreage would actually be mined).

The above completes our specific comments.

9 In conclusion, we believe that the members of the State of Montana and Federal EIS Team should be complimented on producing a very thorough and complete draft environmental statement. Our chief concern with the Pearl document is the implication that Little Youngs Creek can not be mined if it is declared an alluvial valley. Hydrologic and technical information has been submitted so that the regulatory authority can make a determination as to the presence or absence of an alluvial valley floor. Further, our present mining and reclamation plan commits us to special handling and replacement of any alluvial material in and adjacent to Little Youngs Creek. A determination has been made by the U. S. Soils Conservation Service that there are no prime farm lands within the area of Little Youngs Creek that would be mined. Therefore, we believe that the EIS should not state that the mining of Little Creek not be allowed if this stream is declared an alluvial valley. This decision should only be made after the regulatory authority has evaluated all of the available information.

Very truly yours,

WC Shahan

for N. J. Isto
Manager of Mines
Mining Ventures

ATI:CC

9 Thank you for your comments.

NORTHERN PLAINS RESOURCE COUNCIL

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August 8, 1979

NORTHERN POWDER RIVER BASIN COAL &
PEARL MINE DRAFT EIS

The Pearl Mine EIS

45 iv. Section F. seems to be missing.

46 iv. G. Which site is eligible for nomination?

47 I-1. Have any contracts for the coal from the Pearl mine been signed yet? If not, will this have any effect on the proposed mining timetable.

48 I-12. F. 1. What other mines is this statement referring to?

1-44 Responses to comments 1 through 44 are in volume 3, the regional analysis.

45 The lettering is wrong here; reletter this section B, C, D, E, and F.

46 See volume 2, chapter II, N, page II-44.

47 This information is not available to the task force. It is conceivable that there would be a delay if there were a lack of firm commitments.

48 Change "would" to could. This statement refers to the potential for future development and not to any one mine.

49 I-16. 8. What is adequate retention time?

50 I-20. para 2. Will a logical mining sequence exist even if Shell doesn't obtain coal reserves to the North and West?

51 I-20. para 4. Are problems anticipated with accumulating water? Particularly in regards to composition, what mitigating measure would be taken (chemicals) to purify the water?

52 I-32. d. What other mines does this refer to? Also, the first sentence states that " after mining is completed, reclamation would continue until completed." However it seems that silos, powerlines etc. would be left for future mines, and that the area would be reclaimed when these facilities are no longer needed. Is this considered a concurrent reclamation plan?

53 II-9. 2.a. Data should be gathered on Little Youngs Creek alluvium instead of assuming that its' characteristics are similar to Youngs Creek.

54 II-12. C. States that: "Groundwater data are not available for the actual minesite". This is the most blatant example of these documents appalling treatment of hydrological considerations. How can a mine plan, let alone a viable reclamation plan be proposed without groundwater data from the "actual minesite"?

55 II-18. D. para 2. Three miles is rather far out for an air-monitoring station.

56 II-37. para 1. States that, "Golden eagles...are nesting species of the Pearl vicinity", therefore the Pearl mine seems to be in violation of 16 USC 688 The Bald Eagle Protection Act of 1969 which provides that "no mining operations are to be permitted an any area where the activities would harm or disturb...raptorial birds, including bald or golden eagles."

57 II-40. 10. States: "There are no records of rare, threatened, or endangered wildlife species on or near the Pearl mine permit area". This seems to be in direct conflict with II-37 quoted above.

58 III-I. 1. a. More information is needed on Little Youngs Creek so that its susecptability to erosion can be evaluated.

59 III-2. b. reclamation: There is a high clay content in the area in question. It should be mentioned due to the possible effect it might have on permeability and its direct relation to reclamation.

60 III-3. 2. States that "toxic material within the overburden may be placed within the root zone during reclamation". This is a complete reversal from the statement on p. I-23 b. which says: "Any potentially toxic over and interburden materials would be selectively buried below the rooting depth of the vegetation."

49 State regulations require that sedimentation ponds provide 24-hour theoretical retention time for the inflow or runoff entering the ponds.

50 This should be north and east, not north and west. This mine plan is a logical sequence independent of the aquisition of further leases.

51 At present, the only chemical treatment contemplated is the use of a flocculant to reduce suspended particles. Discharge from the company's sediment pond, under the present design, should occur only during floods from a 10-year, 24-hour (or greater) precipitation event.

52 See response 48.

53 The data are now being gathered by the company on Little Youngs Creek alluvium and will be used in the final decision making.

54 Some ground-water data were available, as indicated from the previous paragraph. Data on ground-water quality were lacking on the actual minesite; however, ground-water quality does not vary significantly over short distances and therefore the analysis is not significantly affected. More ground-water data are being gathered. Viable reclamation depends on postmining topography, soils, vegetation, and climate and depends little on ground water.

55 Comment noted; however, this site was the nearest site from which any long-term data were available when this document was written.

56 The appearance of golden eagles in the vicnity of the proposed Pearl mine does not necessarily mean that golden eagles would be harmed or disturbed by the proposed activities. No nests have been found in the mine area.

57 Golden eagles are not listed as a rare, endangered, or threatened species under Federal law.

58 Comment noted. More information is being collected.

59 Comment noted. See volume 1, page IV-29.

60 The lower limit of the rooting zone is quite variable, and despite the company's good intentions, it is possible, as stated in chapter I of volume 2, that these materials may be placed within the root zone. Change "be placed within" to come in contact with.

61 III-4. para 2. The reference to replacing bedrock aquifers with highly permeable soils neglects to take into consideration the previously mentioned high clay content of the soils in this area.

62 III-4. 1. Surface Water. para 3. What protective measures are referred to, and when would they become effective?

63 III-7. Table III-2. Doesn't this data indicate a potential problem with irrigation? Particularly the Na & SO_4 comparisons between Youngs Creek near the highway(below the Ash Creek Mine), and Youngs Creek primarily on the Crow Reservation(above the Ash Creek mine)? Wouldn't the Pearl mine add significantly to this problem?

64 III-8. para 2. The Surface mining regulations, (30 CFR 715.17) states that surface mining operations must be planned and conducted to "preserve the essentially hydrological functions...throughout the mining and reclamation process", NOT JUST RESTORATION TO ITS PRESENT LOCATION. This is important due to the lack of information on the Little Youngs Creek hydrology and the seeming ambiguity concerning the effects of high clay content in the soils of the region.

65 III-22. 5. Raptors. "Birds of prey would be adversely affected by disruption of nesting sites and hunting areas". This statement seems to indicate another violation of 16 USC 688 Bald Eagle Protection Act of 1969.

66 III-24. para 1. An effort should be made to gather more information on grouse in this area.

67 III-32. para 1. Are any mitigating measures planned to offset the stated increases in traffic?

68 V-2. last para. States: "A more detailed analysis of cumulative unavoidable impacts can be found in the regional statement (chapter V). the Regional statement has 1½ pages devoted to this and we feel that this does not represent a "more detailed analysis".

69 VI. last para. Somewhere along the line the effects on "locals" seems to have been assigned a much lower priority than the consideration given the Region. This was supposed to be a site-specific EIS.

70 VII-1. para 2. How is this 500 Af/yr arrived at? The regional EIS on p. II-16 states that individuals consume .06 acre/ft a yr. and the Pearl EIS p. I-1 states that 460 individuals will be drawn to the area, the figures don't seem to compute to reach 500 acre/ft yr.

71 VIII-C. 1-9. Since most of the proposed alternatives seem to minimize to a degree the effect of the Pearl Creek mine, we fail to see why they weren't included in the first place. To continually attempt end runs

61 The statements are not contradictory. Although most of the spoils deposited by dragline are more porous than undisturbed overburden, the surface of the regraded and compacted spoils is less permeable than the original soils. This is caused by increases in bulk density and the loss of structure, pore space, and root channels. Clays in the near-surface spoils reduce infiltration and percolation rates. Rahn (1976) discusses both increased porosity and decreased infiltration rates of the spoils.

62 "Protective measures" refers to the reclamation process--that is, revegetation and mulching. The time at which these measures become effective is not known.

63 See letter 5, response 24.

64 The hydrologic functions of the alluvium are addressed in the second sentence of this paragraph.

65 There are no nests sites of raptors which are rare, endangered, or threatened species, or species of special concern on the minesite. Therefore there is no conflict with the Act.

66 More information is currently being gathered.

67 Currently the company has no plans to offset increased road traffic. However, the company (1979) would give consideration to mitigating measures such as busing, car pooling, etc., depending on circumstances when mine construction starts.

68 Comment noted. The discussion is nonetheless adequate; the reference is not to a "detailed analysis," but to a "more detailed analysis."

69 The relationship between this paragraph and your comment is unclear.

70 Calculations were incorrect; consumptive use should be about 28 acre-feet per year.

71 The function of the EIS is not to change mine and reclamation plans as proposed by the company, but to assess impacts and propose alternatives.

by awaiting various agencies to "stipulate alternatives" brings on the same onus of regulation that is being bemoaned throughout the land. We feel that such alternatives should have been solicited by the team at the onset, as mandated by NEPA and CEQ regulations.

72 In Summation: This EIS is inadequate for several reasons: The first is that it fails to take full cognizance of the people oriented impacts associated with this kind of development. Instead it attempts to pass the buck on to the Regional EIS. There is also an obvious need for more hydrological data on Little Youngs Creek, but more importantly on the "actual Minesite". This was supposed to be a site-specific document, the attempts made to defer comment to the regional EIS can only be viewed with justifiable indignation. The Pearl Creek mine seems to be riding the tail of the Regional EIS through the review process. Hopefully the final will be able to stand on its own merits.

These comments have been prepared by the Northern Plains Resource Council.

72 The Pearl site-specific (volume 2) was not designed to stand alone; consequently the references to the Northern Powder River Basin Coal EIS (volumes 1) are intentional. The regional evaluates the cumulative impacts of coal operations of coal operations at several levels of production. Volume 2 addresses a particular mine plan; it references volume 1 for both baseline information (where applicable) and cumulative impact evaluation.

Powder River Basin Resource Council
48 North Main Sheridan, Wyo. 82801 (307) 672-5809

7 September 1979

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT, PROPOSED MINING AND RECLAMATION PLAN, PEARL MINE, BIG HORN COUNTY, MONTANA

With the exception of four major categories of comments -- (1) Alluvial valley floors, (2) water impacts, (3) air impacts, and (4) Shell's future plans, the comments on this DEIS will go in order from the beginning to the end of the document.

page no.

1 1-5 On this page, it is stated that there are an estimated 60 million tons of coal reserves in Shell's lease. On page 1-10, it is estimated that Shell will recover 46.5 million tons of this total, or about 78%. However, on page 1-17, the DEIS states that Shell plans to use mining and spoiling techniques which will enable them to recover 90-95% of the coal. How can this contradiction be resolved?

2 1-14 It appears that the proposed Shell rail spur will cross Highway 338 once, the Ash Creek road at least twice, and the Prairie Dog Road once. On page III-32, it states that there will be a separated grade on the highway crossing and apparently one for one of the Ash Creek road crossings. The others will be at-grade, and the DEIS indicates that this will cause some inconvenience and possibly block travel of emergency vehicles. This situation could be alleviated by making all crossings on a separated grade, or, at the very least, setting up a radio system to warn trains of emergency vehicle travel so that the train can either stop short of a crossing or be broken at the crossing.

3 1-17 The DEIS states that a blasting schedule will be either posted or published to warn nearby residents and local governments. The federal Surface Mining Reclamation and Control Act (SMCRA) requires publication of blasting schedules.

4 1-20 The DEIS states that Shell plans to overstrip in order to recover more coal from the lease. Will this involve overstripping into Wyoming?

5 1-26 On this page and the following, a post-mining contour map is provided. However, since a pre-mining contour map was not provided for comparison, these two maps are useless. Please provide a complete set in the final EIS.

6 1-28 On this page, the DEIS states that 6-10 inches of topsoil will be replaced on the mined land. However, on page 1-20, it says that topsoil for replacement will be limited, and on page 1-24, it says that topsoil available for salvage cannot be calculated from available information. Is there, or is there not, enough topsoil available for reclamation, and if so, how much is there?

1 The recoverable surface stripping of coal reserves constitutes 78 percent of the coal within the lease area. Of this 78 percent, only 90 to 95 percent can be recovered by current mining techniques because it is impossible to drop a vertical highwall to the depths to which the company proposes to mine. Benches must be constructed, resulting in a 5- to 10-percent loss of coal. Additional sources of coal loss include coal fenders at the sides of the seams and the cleaning process at the coal-overburden interface. Recovery of 90 to 95 percent of the strippable reserves is relatively high and is due in part to this being a truck and shovel operation as opposed to a dragline operation.

2 Comment noted.

3 Delete "either" from this sentence; change "or" to and.

4 This is being negotiated with the adjacent land owner in Wyoming, the Ash Creek mine. The company could not overstrip into Wyoming without receiving the necessary permits from the Department of Environmental Quality.

5 Premining contours are shown in figure I-2, page I-3.

6 The company has stated the soils resources could provide at least 6 to 10 inches of topsoil for replacement; hence the statement on page I-24. Page I-20 states that "Topsoil in desirable quantities is limited...." This means that it would be desirable to have more topsoil than is available on the permit area.

On page II-24 (not I-24) the statement is made that "the actual topsoil resource available for reclamation cannot be accurately calculated from the information provided." The probable depth of available suitable topsoils material ranges from 20 to 24. Refer to the first paragraph on page II-24.

All the topsoil existing in the area will be salvaged and used for reclamation, as required by law. Topsoil quantities should be sufficient for reclamation.

7 page no. II-31 On this page, the DEIS states that the mule deer population couldn't be definitely determined, partly due to the "scope of study". What does that mean?

8 II-35 According to this part, the proposed Shell rail spur will cut through two key antelope wintering sites. Have alternative routes for the rail spur been examined?

9 II-37 There are three active golden eagle nests within 1½ miles of the permit area. On page III-22, it is acknowledged that mining will destroy much of the small mammal population, thereby reducing the prey base for the eagles. Golden eagles are a protected species under federal law. Does Shell plan any measures to mitigate the adverse effect of this mine on the local eagle habitat?

10 II-40 Sections H and I, Sociology and Economics, are hopelessly inadequate. A reference to the regional statement on these topics is not a substitute because the assessment of those topics in the regional statement was also hopelessly inadequate. The final EIS on the Pearl Mine should contain some decent socioeconomic data that can be evaluated.

11 II-40 Section J, Community Services, is no better than H and I above. The regional statement does not do a good job of discussing the available community services in the impact area. The Pearl Mine EIS must take the responsibility for accurately addressing this issue as it pertains to the development of Pearl.

12 III-2 On this page, it is stated that the natural breaks and benches of the permit area must be restored if serious erosion is to be prevented. Will the mining and reclamation plan be changed to attempt this sort of restoration?

13 III-16 From the information available here, it seems that toxic overburden may present significant reclamation problems. However, there is no mention in the DEIS of how this problem will be addressed. Please discuss this important topic in detail in the final EIS.

14 III-20 There is a statement on this page that the post-mining grazing capacity on the permit area may be 50% more -- or less -- than it is now. What factors may lead to 50% less grazing capacity? How might these be prevented?

15 III-25 On this page, it appears that the so-called "new town" is not as likely a possibility as some might think, and that in any case, people will probably prefer to live in Sheridan. This further exacerbates the problem of not having any socioeconomic data in this DEIS, because the regional depends heavily on the concept of the new town.

16 III-26 According to a statement on this page, high wages in the mining industry have not caused general wages in the area to go up. This may be true. However, it has caused rapid turnover and consequent drop in quality of service in other sectors of the economy, because workers are constantly being drawn away to the mining companies. Agriculture and municipalities cannot compete with the wage scale of the mines, and therefore cannot secure an adequate workforce.

7 This means that the study assessed the permit area, not of the surrounding region.

8 This type of analysis is beyond the scope of this EIS, as the engineering expertise necessary is unavailable for such an analysis. However, it is possible to examine alternative routes in a very general way. The actual feasibility of alternative routes is dependent on such factors as land availablility, cuts and fills required, gradients involved, etc. Coming south from the Decker mine to Pearl with a rail spur would involve major changes in gradient in crossing the drainage divides and would probably result in greater total disturbance than the proposed route. There is no rail line such that a spur could be built from the west. Any spur connecting with the Decker spur, either to the south or to the east, would have to cross several drainages, the impacts of which would be similar to those impacts described for the proposed route.

9 Golden eagles are neither threatened nor endangered. Given the range of an eagle, the disturbance of perhaps 800 acres of small mammal habitat is insignificant. In addition, at all times during mining there will be some small mammal habitat. As shown in table III-1, 163 acres of land is the maximum area disturbed at any one time; the average is 108 acres disturbed (unreclaimed) per year. Although of somewhat different quality, the reclaimed surfaces provide habitat and are rapidly recolonized by the more opportunistic of the small mammals; this rapidly restores some of the prey base. Although cottontails would be impacted the most, they are not the only prey of raptors. See letter 22, response 65.

10 Comment noted. The social and economic data are sufficient for the purposes of impact analysis. It is necessary to define the specific information lacking.

11 See response 10 above.

12 Changes in slope morphology would be made.

13 This inconsistency is due to changes in the mine plan prior to printing of volume 2. As noted on page I-23 of that volume, the company would selectively salvage and bury toxic overburden. This <u>is</u> required by the regulatory agencies.

14 A 50-percent loss could be due caused by a number of factors: poor reclamation due to climatic factors; excessive erosion due to climatic factors; poor selection and placement of overburden; poor postmining land management; inadvertent contamination of topsoils with overburden materials; etc.

15 Comment noted. In any case, the baseline is the same; the only difference is in the distribution of impacts.

16 Comment noted.

17 III-27 A statement on this page notes what everyone in Sheridan County already knows -- that Big Horn County will benefit financially from construction and operation of the Pearl Mine, but Sheridan County will not. This very serious problem is not addressed anywhere in the Pearl Mine DEIS.

18 III-28 This page goes on to explain that needed public facilities in Sheridan County may not be "funded in a timely manner". That is, if they are ever funded at all. We request that the final Pearl EIS look at the problem of development occurring on one side of a state line while all the socioeonomic impacts occur on the other. This is not an easy problem to deal with, but the solution is not simply to ignore it.

19 III-32 This page states that users of the county roads which provide access to the Pearl Mine will probably pressure the county for paving at least to the state line. The statement is also made that increased road use will consequently increase road maintenance costs, which of course are paid by the public. Shouldn't the company or companies responsible for the increased traffic also be responsible for the expense of improving and maintaining roads which are going to require that extra care because of the company activities?

20 Chapter IV It is amazing that the most which could be done to mitigate all the environmental effects described in Chapter III was to employ best management practices to control fugitive dust. This chapter should at least address all the problems brought up in the previous one.

21 V-2 The notion that socioeconomic impacts in Sheridan County are unavoidable may be true -- but that doesn't mean that Shell is helpless to do anything to help mitigate them. Shell belongs to the Wyo-Mont Industrial Association, an organization whose avowed intent is to help the Sheridan community deal with impacts from industril development. Can specific impact mitigation measures, in proportion to Shell's share of the cumulative impact expected for the Sheridan area, be included in the final EIS?

Additional cars seem to be another unavoidable impact. There is nothing to prevent Shell from busing its workers to the mine, thereby eliminating a great deal of impact due to increased traffic in the area. This is mentioned on page VIII-5.

22 VI-I A statement on this page reveals a lot about the mind-set behind preparation of this DEIS. One of the short-term gains of the Pearl development is profits for Shell Oil Company, while there will be a long-term loss of agricultural productivity -- which is only important locally. Doesn't the local agricultural community have just as much of a right to maintenance of its resource base as Shell does to its profits?

Alluvial Valley Floors (AVFs)

23 On pages 1-13, 1-23, II-1, II-2, II-9, II-10, II-27, II-30, II-41, III-18, III-29, and various other places, references are made to alluvium, flood irrigable fields, irrigated hay meadows, subirrigation, and other indications of significant farming activity on an alluvial valley floor. Apparently Shell is now looking into the question of whether their permit area contains an AVF as defined by SMCRA.

17 Comment noted. This has been discussed in volume 2. There are however also positive impacts to Sheridan, as noted on page III-26 of volume 2. These include increases in employment, increases in sales tax revenues, and an increase of about $3.7 million in total annual personal income. See volume 3, chapter IX, letter 31, responses Q through BB and the Summary of Hearing Statements (2)(b), summary of hearing comments by Tom Arrison, fourth comment.

18 The impacts have been concisely stated. Chapter VIII (volume 2) refers the reader to the regional (volume 1) for additional alternatives not given in Pearl. Social and economic alternatives given on page VIII-39 and VIII-40 of the regional (volume 1).

19 The EIS does not assign responsibilities for the expense of improving or maintaining roads impacted by mining.

20 The information you request is in chapter VIII of volume 2.

21 Possible mitigation measures (alternatives) are presented in chapter VIII of both volume 1 and 2. Most social and economic data are presented in the regional.

22 The decision that this area was acceptable for mining was made when BLM issued a Federal coal lease to the company. At issue in this EIS is how mining should occur in order to minimize impacts. Reasonable alternatives have been covered. If mining were determined to be totally unacceptable, a decision not to mine could still be made. The right of the agricultural community to its resource base is directly correlated to its ownership of that resource base.

23 The impacts of mining through the alluvium, under the proposed plan, will not change whether ot not Little Youngs Creek is "designated" an alluvial valley floor under the SMCRA. If the mine plan were to change, and Shell did to not mine through the creek, the impacts would be less than the "worst-case" presented here; therefore, a supplementary EIS would not be necessary.

If the permit area does contain an AVF, significant changes will have to be made in the mining and reclamation plan, as noted on page III-8. If an AVF is designated on the prposed Pearl Mine property, we suggest that a supplementary DEIS be issued that addresses this critical problem.

Water Impacts

24 This is somewhat related to the alluvial valley floor issue. First, there is a potential problem with water rights in Little Youngs Creek and Youngs Creek. On page 1-20, the DEIS indicates that water will be diverted from Little Youngs and discharged into Youngs. Will this loss of water from Little Youngs affect
25 downstream water rights?

Further, on page III-3, it appears that mining may lower the alluvial water table , and that the surface flow in Little Youngs could decrease as a result. Again, will this affect downstream water rights? If so, what will
26 be done to replace that lost water?

What will be done if the springs supplying domestic water dry up, as is presented as a possibility on page III-4? What could be done to replace
27 water lost if the local ranchhouse well goes dry (page III-9)?

Will the needed information to evaluate the Little Youngs Creek diversion be presented in the final Pearl EIS? (lack of information stated on pages
28 III-1 and III-4)

Will information needed to evaluate the Little Youngs Creek channel
29 design be available in the final Pearl EIS? (page III-2 and 3)

On page III-3, the statement is made that groundwater movement within the
30 permit area will be altered. Altered in what way?

On page V-1, the statement is made that lost water can be replaced by tapping deeper aquifers. This statement ignores the fact that tapping deeper aquifers will probably involve a considerable expense to a farmer or rancher whose shallow water sources have been lost due to mining. If such an event occurs, the company should be responsible for replacing the lost water
31 supply.

Page VII-I states that if the hydrologic integrity of the affected bottomland cannot be restored, then the water could not be used for domestic or livestock purposes because of the high concentration of TDS. What will be the long-term effects of precluding a return to agricultural uses?

Air Impacts

32 According to page II-15, the airshed over the Pearl permit area adjoins that of other Decker-area mines. However, the DEIS fails to include any cumulative assessments of air quality impacts, and the regional statement does not do a thorough job in that area either. We would note that air quality data collected in 1975-
33 76 (page II-19) probably does not reflect recent conditions.

The DEIS does include suggested mitigation measures for fugitive dust emissions -- for example, on page III-11, it is stated that BACT dust suppression techniques would cut dust emissions by 75%. Will the final Pearl EIS give us some assurance that these dust suppression techniques , including binding agents sprayed onto open coal cars (page III-15) will be used?

24 No water rights will be affected. Page I-20 does not discuss the diversion of Little Youngs Creek. In any case, the diversion would be from Little Youngs Creek to Little Youngs Creek.

25 If downstream water rights are affected, the individuals involved would have legal recourse. If at fault, the company would be responsible for mitigating this impact.

26 The ranchhouse is upgradient and to the west of mining; there should be little if any impact.

27 Any changes in impacts due to availability of additional information are presented in chapter I of this volume.

28 See chapter I of this volume, and letters 5 and 14.

29 As indicated in the text of volume 2, refer to Hydrology, Groundwater, chapter III, particularly page III-8, fourth full paragraph.

30 If such an event occurs, the owner(s) of the wells must file a grievance with the regulatory agency. The company would then be required to mitigate any impacts caused by mining.

31 See page VI-1. Although important on a personal basis, it is not significant in the regional context.

32 Because conditions in this region have remained relatively stable since 1975-76, air quality is probably not significantly different at the present. This is particularly true because no major activities have been undertaken upwind of the area.

33 Permit conditions are established by the various regulatory agencies. BACT is defined on a case-by-case basis by the EPA and the Montana DHES in conjunction with the company. AS yet, BACT has not been defined for the Pearl site. The company does not propose to use binding agents unless required to do so.

Shell's Future Plans

34 There are a number of indications in this DEIS that Shell's mining plans do not begin and end with the proposed Pearl Mine. In fact, two specific statements are made in the DEIS to the effect that Shell wishes to continue mining onto the Crow Reservation (pages 1-20 and 111-1). In addition, Shell is planning to build a coal storage facility far greater than would reasonably be required for the Pearl production, and plans to leave the loadout facilities for the use of other mines in the area (pages 1-12 and 1-15).

In fact, given the investment required for this relatively small amount of production (for example, a 15-mile rail spur and 25,000-ton storage facility), and given the apparent problems with the Pearl property (potential alluvial valley floor, abundant toxic overburden, and so forth) it appears as though the Pearl Mine is nothing more than an effort on the part of Shell to get its foot in the door for mining on the Crow Reservation, and that the impacts of the Pearl Mine are going to be small relative to other development planned for the area. What now seem to be relatively minor impacts (assuming that the problems outlined in the DEIS can be worked out) of the Pearl Mine are probably only a portion of the entire picture, which raises serious questions as to the utility of this entire DEIS.

34 Comment noted. Shell and other companies do have future plans in this region. However, this analysis is of mining coal under a lease being developed at the present time. Future leasing and development of either Crow leases or Federal leases is speculative and beyond the scope of this document. The company (1979) has stated that it is highly doubtful if mining could be carried from a Federal coal lease into an Indian coal lease. Further, a 100-foot buffer zone has been left between all mining activity and the Crow Indian Reservation.

Additional Comment

35 Nowhere in this DEIS are the impacts of the 15-mile rail spur discussed except with a passing reference to anticipated erosion on rail cuts. This proposed rail spur is an integral part of this proposed mining operation and the impacts associated with it must be discussed in detail in the final EIS.

35 The rail spur is not on the permit area, nor is it to be considered in DSL's permitting decision. Impacts, however, are discussed. See Hydrology, page III-3; Vegetation, page III-18 to III-20; Wildlife, page III-21, first and fourth paragraphs; Land Use, page III-29, fourth paragraph; and Transportation, pages III-32 and III-33, the bottom and top, respectively.

Thank you for this opportunity to comment.

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24. Public Hearings: Summary of Principal Comments

Public hearings on the Northern Powder River Basin and Pearl mine environmental statements (DES 79-41) were held at Forsyth, Montana, and Sheridan, Wyoming, on August 22 and 23, 1979, respectively. A summary of testimony at the hearings, and references to responses in the written comments are presented below. Transcripts of the hearings are on file at the Montana Department of State Lands, 1625 Eleventh Avenue, Helena, Montana 59601, and at the U.S. Geological Survey, Box 25046, Mail Stop 701, Denver Federal Center, Denver, Colorado 80225.

Testimony at the hearings was given by 12 individuals. Of the three individuals commenting at Forsyth, all addressed the volume 1, the Northern Powder River Basin Coal statement. In Sheridan, five of the nine individuals commented on volume 1, while four commented on the Pearl mine, volume 2. One of these individuals favored approval of the Pearl mine for the following reasons:

> They (Shell) have "been a very important part of our community and have been good neighbors, and they are our partners and progress."

The remaining testimony directed at the proposed Pearl mine was concerned primarily with the hydrologic impacts of the mine and the designation of Little Youngs Creek as an alluvial valley floor.

If the hydrologic integrity of Little Youngs Creek is restored, no water rights would be affected downstream of the mining. Shell will have to apply for permits from the Wyoming Department of Environmental Quality. Wyoming will have to permit or reject the plans for the portion of the rail line passing through Wyoming and that portion of the Little Youngs Creek diversion that affects Wyoming. See letters 14, 19, and 20.

The company was concerned over the documentation of poor water quality in the resaturated spoils. The reference for this is:

> Van Voast, W. A., Hedges, R. B., and McDermott, J. J., December 1978, Strip coal mining and the mined-land reclamation in the hydrologic system--southeastern Montana: Old West Regional Commission, Billings, Montana.

and

> _____1977, Hydrologic conditions and projections related to mining near Colstrip--southeastern Montana: Bureau of Mines and Geology, Bulletin 102, 43 p.

Concern was also expressed over the uniform slopes. The agency is concerned about slope morphology and not about topographic uniformity of slopes. The 5:1 requirements do not preclude the construction of a geomorphically stable slope by altering the slope morphology from the contours presently proposed by the company.

The company expressed the view that it has designed its reclamation to restore productivity to levels equal to or greater than that of the premining productivity. In response, it should be noted that good design does not guarantee success. Additionally, the EIS analysis is based on potential premining productivity not on existing premining productivity. Productivity varies in response to management.

Revegetation results to date in the northern Powder River basin indicate difficulty in reestablishing both vegetative quantity and quality to support premining levels of grazing and wildlife use. (See volume 1, regional analysis, p. IV-33 through IV-36.) Reclamation of surface mined land is experimental, the product of approximately six growing seasons of legally required efforts. While the company may be using the best reclamation technology available to them, our best projection is that recovery will require decades.

E. CORRECTIONS

The following additions and/or changes should be made in volume 2 of this final environmental statement:

Page I-1: Insert after last line: Mining Control and Reclamation Act of 1977.

Page I-11: The Wyoming portion of existing county road should be relocated to fall on the section line.

Figures: Relocate the permit boundary lines, in all applicable figures, to coincide with the 100-foot buffer zone shown in figure I-8.

Page I-14: On this figure delete the extension of a rail spur into the Crow Indian Reservation.

Page I-17: Section 3, line 5: change "west" to east.

Page II-3: The left-hand side of this figure is downfaulted, and the right-hand side is uplifted.

Page II-5: Table II-1: Change "Federal livestock standard" to Threshold standard.

Page II-40: A species list for fish is provided in the preceeding section of this chapter in letter 5, response 23.

Page III-6: Last paragraph, line 6, last word: Change "the" to and.

Page III-19: Footnote 7: Change "sec. 519 (b)" to sec. 515(b)(19).

Page VII-1: Second paragraph, line 5: Change "500 acre-feet per year" to 28 acre-feet per year.

Page VIII-4: First paragraph: Change "2ppm" to 0.3 ppm.

Page XI-46: Add:

[1]PEDCo - Environmental, Inc., March 1977, Southeastern Montana coal resource, AQMA analysis: U.S. EPA, Region VIII, Air planning and operations section, Denver, Colorado, 52 p.

[2]U.S. EPA, February 1978, Survey of fugitive dust from coal mines: Region VIII, Denver, Colorado, 115 pp.

[3]Draft EIS, Eastern Powder River coal basin of Wyoming, 1974, prepared by the Departments of Agriculture and Interior and the Interstate Commerce Commission, appendix B, p. 1-7.

[4]U.S. EPA, 1976, Compilation of air pollutant emission factors for fugitive dust sources, second edition, Report No. AP-42, February, Table 8.20-1. p. 8.20-1.

[5]PEDCo - Environmental, Inc., 1973, in Final northwest Colorado coal final EIS: Department of the Interior, appendix D, p. VI-24.

CHAPTER X

REFERENCES

Johnson, M. V., and Omang, R. V., 1976, A method for estimating magnitude and frequency of floods in Montana: U.S. Geological Survey Open-file Report 75-650 (FHWA-MT 8519 R-3), 35 p.

Rahn, P. H., 1976, Potential of coal strip-mine spoils as aquifers in the Powder River Basin: Billings, Montana, Report prepared for the Old West Regional Commission, Project 10470025, 108 p.

Shell Oil Company, October 23, 1979, Letter to S. Johnson, Montana Department of State Lands, 2 p.

U.S. Environmental Protection Agency, March 1972, Ecological Research Series - Water Quality Criteria 1972: Washington, D.C., 594 p. (page 315).

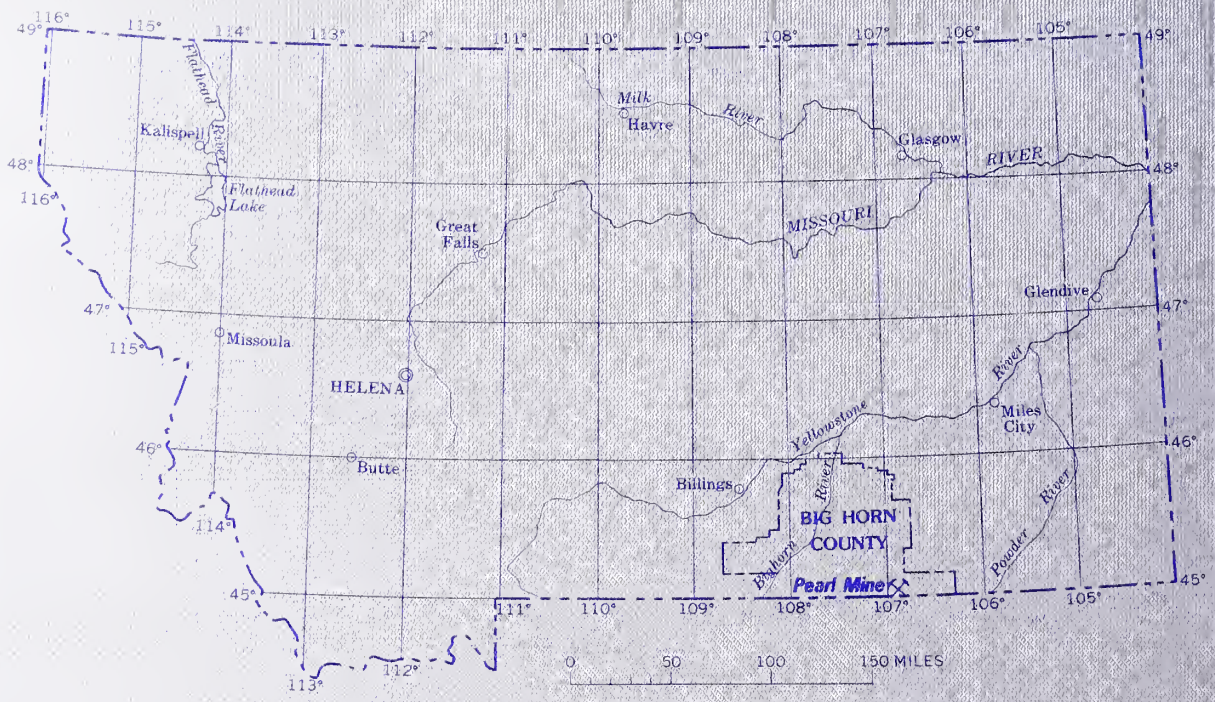
Van Voast, W. A., Hedges, R. B., and McDermott, J. J., December 1978, Strip coal mining and the mined-land reclamation in the hydrologic system--southeastern Montana: Old West Regional Commission, Billings, Montana.

_____1977, Hydrologic conditions and projections related to mining near Colstrip --southeastern Montana: Bureau of Mines and Geology, Bulletin 102, 43 p.

ENGLISH-METRIC CONVERSION FACTORS

To convert English unit	Multiply by	To obtain Metric unit
Inches (in)	2.54	Centimeters (cm).
Feet (ft)	3.048×10^{1}	Centimeters (cm).
	3.048×10^{-1}	Meters (m).
Miles (mi)	1.609	Kilometers (km).
Square feet (ft^2)	9.290×10^{-2}	Square meters (m^2).
Acres	4.047×10^{-1}	Hectares (ha).
	4.047×10^{-3}	Square kilometers (km^2).
Acre-feet (acre-ft)	1.233×10^{3}	Cubic meters (m^3).
	1.233×10^{-3}	Cubic hectometers (hm^3).
Cubic yards (yd^3)	7.646×10^{-1}	Cubic meters (m^3).
Pounds (lb)	4.536×10^{-1}	Kilograms (kg).
Short tons (tons)	9.072×10^{-1}	Metric tons (t).
Pounds per acre (lb/acre)	1.12	Kilograms per hectare (kg/ha).
Btu/lb	2.326	Kilojoules per kilogram (kJ/kg).
Gallons (gal)	3.785×10^{-3}	Cubic meters (m^3).
Gallons per minute (gal/min)	6.309×10^{-2}	Liters per second (L/s).
Degrees Fahrenheit (°F)	([1])	Degrees Celsius (°C).

[1]Temperature in °C =(temperature in °F - 32)/1.8.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Butte
Billings
Yellowstone River
Miles City
Bighorn River
BIG HORN COUNTY
Powder River
Pearl Mine
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